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**SUPERVISION AND TEACHING
OF HANDWRITING**

Supervision and Teaching of Handwriting

By

JOSEPH S. TAYLOR

DISTRICT SUPERINTENDENT OF SCHOOLS, NEW YORK

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PREFACE

"There are always more people," says Walter Lippmann, "interested in finding out who started the fire than in helping the firemen. Therefore, the saints are noticed on the editorial page, but the devil is news. And generally men are more interested in fixing the blame than in fixing the trouble." This is the reason why complaints about the product of our public schools occupy so much more space in the press than constructive proposals for their improvement. This book is an attempt to help the firemen. Never mind how bad the handwriting of children is: advertising the faults won't cure them. Here is an attempt to find out what is the current practice of successful penmanship teaching and supervision and what is the scientific warrant for such practice. The author has gone over the principal experimental studies in handwriting and has endeavored to organize these results into usable procedure for teachers and their supervisors. Several excellent treatises on penmanship, scientific in character, are already available; but the author hopes that his emphasis upon supervision is sufficient excuse for the publication of another book.

The measurement movement in education has a

tendency to express its findings in highly technical language. "Technical words," writes Hilaire Belloc, "arise of themselves in any science or art, and there is no force, even of a god, that could keep them out. But that is only their genesis. Their true use is to bamboozle and, my word, how well they do it!" We teachers are children of a larger growth and we find much of the stuff that comes to us out of educational laboratories over our heads. We can not use it until some one translates it into our vernacular. I do not think investigators mean to bamboozle, but, nevertheless, like Holmes's "Katy-did," they often "say an undisputed thing in such a solemn way." In penmanship, for instance, vast resources of time and money and human energy have been expended to prove what every writing teacher knew long ago from personal experience. It is something to have this experience confirmed by scientific methods and expressed in technical terms; but the teacher is properly resentful when he sees a bit of truth that he always knew strutting about in the fine feathers of Professor Peacock. The writer recently, in the course of some research work in geography, ransacked the catalogue of a great university library, and there fell upon a graduate thesis on "the causal series in geography." It purported to be an original contribution. On reading it, he discovered that it was what he had been in-

sisting on during all his supervisory career. No wonder cynics like Belloc cry out, when they see familiar vacuities decked out in pretentious technical language: "Having mastered the terms, anyone whatsoever, though he be color-blind, cross-eyed, and quite indifferent to proportion, can write the very best art criticism in the world. For criticism is good in proportion to the awe which it excites. For the function of the critic is to criticize—that is, to pull the leg of the middle class."

An attempt has been made in this discussion to express the conclusions of science in terms which the average teacher understands. And this is not done in a spirit of mockery. The author is not making faces at the real discoverer of truth, who must needs speak in the language of his trade; nor is he belittling the intelligence of the class teacher by insinuating that she cannot comprehend the value and outcome of research. He is merely recognizing the fact that the findings of the laboratory are the raw material of method, and that there is room for the educational middleman who works up such material into usable form. The technician stops at formulation, the third Herbartian step. But the cycle of method is not complete until the fourth step has been taken and the truth has been put to work.

This is primarily a treatise on the supervision of

handwriting; but supervision involves teaching, since every attempt to improve writing must of necessity deal with methods of teaching the subject. It was the author's original intention to deal with supervision only, but he had not gone far in his project before he realized that the precepts of the supervisor command little respect unless they are based upon laws of learning formulated by scientific methods. Hence it was necessary to survey the physiology and psychology of movement and the laws of habit formation. These subjects are therefore treated in the earlier chapters. The formulated conclusions are printed in a separate chapter consisting of fifty propositions. The section on method is based on these findings. Then follows an exposition of the educational value of handwriting as an introduction to the discussion of supervision.

The chapters on supervision are founded partly upon experimental studies summarized in earlier pages and partly upon the returns from a questionnaire on supervision of handwriting addressed to one hundred thirteen cities containing a population of fifty thousand or more.

The author has been a district superintendent for twenty-one years. During this period he has each year evaluated the handwriting of all his classes in literal terms and embodied these estimates in his

official reports. But in spite of this effort, progress in penmanship has been unsatisfactory. One reason for this is that it was impossible to compare school with school and class with class in a convincing way with only a subjective standard of measurement. Therefore, in the spring of 1922, he enlisted the services of our Bureau of Reference, Research, and Statistics, to conduct a survey of the handwriting in the district by means of a standardized writing scale. A year later a second survey was conducted by the Bureau after an effort on the writer's part to bring the unsatisfactory schools and classes up to standard.

"Owe no man anything but to love him," says the Apostle. Such a debt is hereby acknowledged to the many persons who have assisted the author in making the surveys discussed in this treatise. First among these is Mr. Eugene A. Nifenecker, who directed the technical aspects of the work. Next come Mr. John L. Stenquist, Director of Educational Research in Baltimore public schools, and Mr. George L. Hentz, District Superintendent of Schools, New York, who were assistants of Mr. Nifenecker and helped to train the scorers. Of other members of Mr. Nifenecker's staff who did the statistical work, the undersigned knows the name of only one—Mrs. Margaret R. Winterble—but all of them deserve praise and gratitude for the pains they

took to insure the scientific accuracy of the results. It is a pleasure also to acknowledge the fine spirit of coöperation shown by principals of schools, and by teachers who volunteered to score the papers. Helpful criticisms were received from the following friends: Dean John W. Withers, of the School of Education, New York University; Dr. David B. Corson, Superintendent of Schools, Newark, N. J.; Dr. Lizzie E. Rector, District Superintendent, New York; Dr. Edward W. Stitt, Associate Superintendent, New York; Dr. Francis H. J. Paul, Principal of DeWitt Clinton High School, New York. To all and sundry, thanks!

JOSEPH S. TAYLOR

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**SUPERVISION AND TEACHING
OF HANDWRITING**

CHAPTER I

THE PHYSIOLOGY OF HANDWRITING

Three Stages of Writing. Ellsworth (15),¹ with some show of reason, divides the practice of writing into the following three stages:

1. *The receptive or imitative stage*, wherein the learner merely copies or imitates the forms, combinations, and movements set before him. This stage is adapted to childhood, when the imitative instinct is strongest, the habits are rudimentary, and the exercise of all bodily functions is pleasurable; say, from five years of age to ten.

2. *The formative or character stage*, wherein the learner adapts and assimilates those forms and methods which appeal to him and incorporates them into habits. This period is between eight and fifteen.

3. *The confirmed or settled handwriting stage*, when the learner expresses his own taste, judgment, temperament, and individuality. This may extend from fifteen to twenty-five or thirty.

The elementary school deals only with the first and second of these stages. That is, at least half of the writing time in the common school is taken

¹ The figures in parentheses refer to the bibliography on page 181.

up in imitating correct forms and movements in an effort to impress the forms permanently upon the child's mind and to make the movements automatic. In the grammar grades the free writing gradually increases in quantity and the copy writing decreases.

A Complex Problem. The art of writing, though apparently so simple and easy after it has been mastered, is in reality a very complex and difficult problem, as one may infer from the fact that the child devotes eight years of school life to it and then frequently passes on with the task only half completed. The process may be divided into various elements, such as materials, position, movement, speed, legibility, slant, and rhythm, each of which is capable of subdivision into many parts or steps. When the writing abilities of the children are analyzed, it is found that each child differs from every other in the class, and is therefore a specific problem for the teacher. Not only do children differ in specific abilities, but they differ in their manner of reacting to instruction and in their rate of developing through practice. For all these reasons the teaching of writing presents formidable difficulties even to the most expert of teachers. To the inexpert it remains an insoluble riddle.

The Writing Movement. Doctor Javal (32) was one of the first investigators to show what actually hap-

pens in the arm and hand when one is writing. By means of a bracelet attached to the wrist and a ring slipped on the little finger, pencils being attached to the bracelet and ring, he was able to show the movements of the forearm and of the hand during the process of writing.

Acting upon the hint thus furnished by Javal, Dr. Charles H. Judd (35) carried the experiment much further and analyzed very completely the movements of the fingers, hand, forearm, and the whole arm during the writing process. Without taking time to describe these investigations in detail, it will be well to consider briefly the conclusions he reached.

1. *Factors.* In order to understand the difficulties encountered by the child in learning to write, it is profitable to know the factors that are involved in the completed writing habit of the adult. Among the physiological elements are the following:

(1) In the ordinary so-called finger movement in writing, the hand takes part very slightly in the formation of the letters, but participates in the forward movement across the page.

(2) The forward movement performed by the hand is itself a compound motion, made partly by the hand from its own center at the wrist and partly by the arm from the elbow as a center.

(3) The experiments show that writers fall natu-

rally into types represented by a preponderance of finger or hand movement. In some cases the line traced by the movement of the hand across the page is almost unbroken, showing that the fingers perform nearly all the work. From this extreme there are found all grades of approach to the opposite extreme where the writer has trained himself to make no use whatever of the fingers.

(4) In all the cases investigated, vertical writers showed a preponderance of finger movement.

(5) There is a third movement of the hand which is known by physiologists as pronation. It consists in revolving the hand and arm about the elbow as a pivot. This is done in order to maintain the uniformity of slant in the writing when the elbow is in a fixed position.

Dr. Judd explains the necessity, effect, and habit of pronation at great length. To test the matter for myself I asked a specialist in penmanship recently to write some lines in my presence. I discovered that this gentleman had entirely eliminated from his habit the element of pronation. On being questioned in regard to the matter, he explained that he frequently required his pupils to write with a penny on the back of the hand to facilitate the inhibition of the movement here called pronation. On further investigation it was found that this gentleman represents the type of

writers that make very little use of finger movements. They maintain the uniformity of slant by moving the entire arm forward, instead of revolving the forearm about the elbow as a pivot

2. *Coördination of movements.* The pregnant fact revealed by this investigation is not that writing involves different kinds of movements, but that many different kinds of movements are performed simultaneously. In physiology such compound movements are called coördination.

There are two kinds of coördinated movements, voluntary and involuntary. Many involuntary coördinations are complete when the child is born. Such are the movements involved in breathing and swallowing. These are controlled by nerve centers which work automatically. The seat of voluntary coördination, on the other hand, is in the brain. Muscles cannot move themselves. Each one is connected with a nerve which carries an impulse from the brain. When a voluntary movement is to be made, the Ego issues the fiat from the executive department of the brain, which we call the motor area, and then messages are sent to the muscles to contract or relax. A coördinated movement requires many different kinds of muscles to act in harmony. Each one must therefore receive an impulse of a certain kind and strength at exactly the right moment, if the combined results of all the

contractions and relaxations are to constitute a perfectly balanced and successful movement. What a tedious and complicated process it is to organize such coördinations may be inferred from the awkward efforts of an infant when he tries for the first time to grasp an orange or to walk.

Applying these facts to writing, we see at once where the difficulty is. Writing is a very complex coördination of muscles of the voluntary kind. The fingers have to move to shape the letters. The hand moves in sympathy with the fingers more or less. At the same time it describes an arc from the wrist as a center, and another arc from the elbow as a center. Finally it performs a rotary motion with the elbow as a pivot. A characteristic of children's writing, as Judd remarks (35:223), is that these "additional arm movements are made by the child, not as well coördinated additions to finger movements, but rather as separate and clumsy interruptions of the finger movement."

3. *Diffusion of movements.* Another important fact in the physiology of writing is what is known as the diffusion of movements. A child's brain is provided with elements which make it possible to perform millions of different kinds of movement. At birth a child's brain is a mass of potentialities. He begins at once to make random movements of many kinds, but no coördinated movements except

such as are involuntary. When, after many trials, he succeeds in getting a group of muscles to act in harmony for the achievement of a definite purpose, as, for example, grasping an object offered to him, we say he has organized that movement. In his effort to organize a movement, he has to make many trials before he energizes just the right muscles to the proper degree. His efforts may be compared to those of a poor marksman in trying to hit the center of a target placed against a barn door. At the end of the trial it will be found that the bullets are scattered all over the side of the barn, and very few have hit the target at all. The shooting is of the diffuse kind. Perhaps as safe a position as any for the spectator is in front of the target.

So when a child is organizing a movement, "the regular lines of connection necessary for coördination have not yet been laid down. An impulse is free to wander about and shoot out at this point or at the other in a very irregular and uncoördinated fashion" (35:221). In learning to write the pupil energizes a great many muscles not needed in the process. "While the finger writing goes on, the hand and arm are all the time, through the diffusion of the stimulation, kept tense and ready to move. Not only the writing arm is diffusely contracted, but the other arm also is having its part in the

agony of effort." The pen is clutched as if it weighed twenty pounds, the face is contracted, the head is drawn down until the nose almost touches the pen point. These are all perfectly natural consequences of the diffusion of movements. "Nature attacks her problems of development by producing more than she needs and then picking out the best. Development means the selection of the right movements out of a total mass of diffuse movements."

What Movement is Most Efficacious? Mr. Frank N. Freeman (23:253; 21) conducted a very important series of experiments to determine what kind or combination of movements is most efficacious. He notes a widespread dogma "that arm movement, or so-called muscular movement, is a superior method of writing, and that writing should be taught by emphasizing this arm movement by giving exercises which develop it, and fixing the child's attention upon it. . . . Scientific evidence refutes it almost completely."

THE PROBLEM STATED

Mr. Freeman set himself the task of examining the current assumptions as to the necessity and prevalence of arm movement in good writing. The subjects chosen included fifty children and adults. The children were from the Chicago University

Elementary School and the Ray School of the public school system. The University children had not received specialized training in handwriting, while the Ray children had been drilled regularly in an arm movement system of writing. From these two schools children were selected who represented the extremes of good and poor writing. The adults were also selected so as to represent good and poor writers. Among the good writers were several professional penmen, including Mr. C. P. Zaner, the expert and author of a writing system.

The method employed undertook to determine what the essentials of good writing are by comparing the behavior of good writers and poor writers. Mr. Freeman mounted a kintoscopic camera over the hand of the writer which could be speeded up to twenty-five exposures per second. This gave a separate photograph of the hand every twenty-fifth of a second. He first investigated a group of details usually assumed to be essential in writing, with the following findings:

1. *Degree of pronation.* He found very little correspondence between this item and the quality of the writing. Hence the old writing masters who compelled their pupils to write with a penny on the back of the hand were inflicting a needless discomfort.

2. *Support of the hand.* More good writers than

poor writers support the hand on the third and fourth fingers.

3. *Angle of arm with base line.* Good writers hold the arm perpendicular to the line of writing more frequently than poor writers.

4. *Relation of finger and thumb on penholder.* The good writers usually grasp the pen in such a way that the forefinger is below the thumb. Many poor writers hold the finger opposite the thumb or above it.

5. *Looseness of grasp of penholder.* Good writers grasp the penholder more loosely than poor writers. This, of course, can be readily explained by the law of diffusion of effort.

Another object of Mr. Freeman's experiment was to analyze the composition of the writing movement. His conclusions on this point are, briefly:

(1) There is no evidence that good writers use more arm movement than poor writers.

(2) Good writers generally move more easily along the line than poor ones.

(3) An important discovery is the matter of *speed changes*. "The good writer divides the writing movement into a series of units, corresponding to the natural units of form of letters, more radically than does the poor writer."

(4) In good writing the letters are formed by a combined movement of the fingers and arm in which either element may predominate.

Whole-Arm Movement. From a report of a penmanship convention (52) we learn that there are two alleged reasons why penmanship is not satisfactory in California. One reason, so Mr. A. N. Palmer stated at the Convention, is "that the rank and file of grade teachers have not been trained in the mechanics and pedagogy of the subject. The other reason is . . . that, because of the peculiar whole-arm penmanship that is largely taught in primary grades in California, pupils acquire incorrect habits and incorrect ideas . . . in regard to the motive power which should be used in connection with handwriting. The habits acquired in primary grades must be eradicated and new habits acquired before even a start can be made toward the development of a style of writing embodying legibility, rapidity, ease, and endurance. . . . It should be axiomatic that nothing should be taught in any grade that cannot be carried advantageously into the penmanship of another grade."

Kind of Movement in the Primary Grades. This opens up a serious disagreement, even among scientists, as to what kind of writing movement should be taught in the primary grades. District Superintendent Lizzie E. Rector, who as principal first successfully introduced the "muscular movement" writing into a New York school, is of the opinion that "early emphasis should be placed upon posi-

tion and movement. If correct position and free movement are to be expected of the higher grades, they must be demanded of pupils as soon as the subject is begun." She is of the further opinion that we cannot successfully stress both form and movement in the early grades; therefore we should emphasize movement.

The New York course of study reverses this suggested procedure and stresses form in the first two grades, no movement drills being prescribed before the second half of the second year.

The question raised here is discussed in the St. Louis Survey by Professor Freeman (24). He is comparing the results of Grand Rapids and St. Louis. In form both cities are below standard in the lower grades. In speed both are above the general average in most grades. Two kinds of practice are encountered, the writer says. In the one case the children are encouraged to write with a fairly high degree of speed, and a relatively low standard of form is tolerated. In the other case their attention is directed more largely to form, and the speed is not so great. "It is argued in support of the one type of practice that the essential for the beginner in writing is to attain fluency and the correct type of movement, and that the form will develop after the proper movement habit has been formed. The contention in support of

the opposite practice is that the prime requisite at the beginning is to develop the proper idea of the form of letters and care in making them, and after this is done speed will naturally develop." Mr. Freeman leans to the opinion that the St. Louis and New York plan of stressing form in the beginning rather than speed and movement is desirable.

This opinion is based upon the findings of Mr. Nutt, which Mr. Freeman reviews and quotes in his own monograph (21). Nutt's investigation was undertaken primarily to investigate rhythm, but incidental discoveries concerning movement are also recorded, which may be briefly summarized thus:

1. *Movement and age.* Mr. Nutt does not distinguish between forearm and whole-arm movement; but the tracer which measured the arm movement was clamped to the hand. It is probable that what was thus measured was forearm movement. His table shows almost no arm movement for ages seven and eight and no high degree of it for any age up to fourteen. Mr. Freeman comments: "These facts do not give any encouragement to the view that the large majority of children can be trained in exclusive arm movement writing. They indicate, further, that if we do stress arm movement we should do so from the ages of nine or ten."

2. *Movement and quality.* The quality was measured by both the Freeman and the Ayres scales. Comparison of arm movement with quality shows that "pupils who make high grades in quality do not use a large amount of arm movement more commonly than the poor writers."

3. *Movement and speed.* Considerable correlation was found between arm movement and speed, though the relation is not "nearly so close as is commonly maintained by the advocates of this method." All the very slow writers use finger movement. On the other hand, many finger-movement writers write with as great a speed as any arm-movement writer.

In this connection we may refer to the innovations of Mr. Harry Houston, of New Haven, and Mr. E. C. Mills, of Rochester, both of whom have discarded the oval and push-pull drill exercises.

Arm movement is secured by writing the letters an inch or more in height, and then gradually grading the writing down to normal size. It is evident that by this procedure form and movement are stressed at the same time and in equal degree. A controlled experiment to test the efficacy of the method of these supervisors should be undertaken at once by some competent investigator.

The movement introduced for practice by these two men is always a definite movement made in

imitation of a letter pattern. It is copy writing just as much as the old copy-book exercises. It differs from ordinary writing chiefly in that it employs the muscles of the forearm rather than those of the fingers and wrist. It requires quite as much concentration of effort as finger writing. When we speak of freedom of movement we mean merely that the writing is done by the muscles of the forearm rather than those of the fingers. The object of movement exercises is to develop the same accuracy for the larger muscles of the arm that we possess in the smaller ones of the hand. The form or model is just as important in the one case as in the other. The object in each case is to impress the model accurately and deeply upon the memory; the drill of writing it many times serves merely to add muscular memory to visual memory. And if we practice the copy long and faithfully the muscular memory will become so perfect that the writing becomes automatic. Drill without careful reference to correct form is just like committing to memory wrong forms in language, or false statements in history, geography, and science. The vulgar slang picked up by children on the street is analogous to the hideous scrawl of those who have been drilled in movement exercises without reference to form.

Rhythm. Rhythm in handwriting as defined by

Freeman is "the relative duration of the successive strokes or units of movement." In order to emphasize rhythm in movement teachers are accustomed to count while children write, or to use words which describe the direction of the movement; as, for example, in drills in capital *M*, the words might be "*higher stroke—over down—over down—over down—under.*"

The most important investigation of rhythm published to date is that of Mr. H. W. Nutt (49). By means of an apparatus especially designed for the experiment, an extended tracing of the writing is taken on a moving strip of paper by means of a typewriter ribbon which travels between this moving strip and a sheet upon which the writing is done. The speed of the moving strip is measured by means of an electric vibrator which traces a broken line on it. Thus the original writing can be compared with the tracing, and by this means the location of the pen point at successive intervals on the original writing is indicated, as in the case of a moving-picture record. Mr. Nutt secured records in word writing only. At the same time the relative amount of hand and finger movement was measured by means of a hand tracer.

Mr. Nutt's object was to secure facts concerning the correlation of rhythm with other factors of handwriting. Records were obtained of 273 chil-

dren living in five cities: Kansas City, Topeka, Winfield (Kansas), Mattoon (Ill.), and Grand Rapids. They were chosen to represent equal numbers of the ages from seven to fourteen. Following are the conclusions in brief:

1. *Rhythm and age.* It is shown that rhythmic movement increases naturally with age.

2. *Rhythm and quality.* No evidence of correlation between rhythm and the quality of the writing appears in Mr. Nutt's tables. Professor Freeman says "there may be, however, certain advantages in rhythmical writing, and these may be offset by disadvantages. . . . This matter recalls the other characteristic of mature writing which has already been mentioned"—continuousness of the movement—"which, when it is developed ahead of the writer's control, is unfavorable in its effect on the form." In other words, just as speed may be developed at the expense of form—as was the case in my own district—so rhythmic movement associated with speed does not necessarily produce good form.

3. *Rhythm and speed.* Nutt found that rhythm shows a decided correlation with speed, "and it resembles speed in that an extreme degree of it is probably unfavorable to form."

Mr. West (71) has also made an interesting contribution to our knowledge of rhythm in handwriting.

He opens his discussion by calling attention to the fact that Freeman and Nutt, in their investigations, have shown that rhythm in writing "increases with age and is assisted by increase of speed," but that "it is not correlated with good form, in fact has a tendency to interfere with quality in certain cases." These investigators, he says, have arbitrarily defined rhythm "as a simple uniformity in duration of strokes."

The experiments of West were undertaken "to gain specific information regarding rhythm as related to the penmanship of good and poor writers of both adult and child groups." The first type of experiment undertook to measure "the amount of time spent on the stroke, and the rest at the terminus of the stroke." The second experiment employed a photographic method "by means of which the actual writing process was analyzed in terms of distance covered during each fiftieth of a second."

The results seem to show that:

- (1) The better adult writers maintain a slightly superior record of regularity.

- (2) The arm is more easily adapted to natural rhythmic movement than the fingers.

- (3) Poor adult writers are less accurate when a rhythmic beat is imposed than good ones.

- (4) The use of a rhythmic guide in penmanship instruction must be carefully supervised and scientifically directed.

(5) Rhythm is not thoroughly adaptable to the process of writing words, but may be used in simple movement drills.

The Slant of Writing. Some twenty-five years ago the writer studied school hygiene at Clark University under Professor Burnham. At that time Germany was the leader in scientific investigations and treatises on this subject. The prevalence of myopia and curvature of the spine among school children led to many studies in Europe which revealed the fact that the malposition of children during the writing period corresponded with permanent defects of eyes and spine.

It was ascertained by one commission that twenty per cent of boys and forty per cent of girls had one shoulder higher than the other; while ninety per cent of spinal curvature was found to be developed during school life. Similar facts were discovered concerning myopia. Spinal defects were traced to the collapsed position in writing, which, in addition to these injuries, inflicts others that affect the general health by retarding the circulation, improperly filling the lungs with air, etc. The characteristics of myopia correspond closely with the asymmetrical position of the eyes in writing. These disclosures were then employed to prove that vertical script was the only hygienic writing possible. Many other assumed virtues

were ascribed to it. Some claimed that it was the natural style, others that it was more beautiful or more rapid, or that it occupied twenty per cent less space than slant writing. Questionnaires were issued and on the basis of the returns the claim was made that business men preferred vertical to slant. The argument ended with the slogan: *The body straight, the paper straight, the writing straight!*

In New York the slant of the writing had never been officially prescribed. The supply list always contained copy books representing all styles and theories, and principals were free to select from the list whatever style they preferred. This liberty was a serious detriment to the writing of the children. A child was likely to encounter a new style of writing every time he was transferred from one school to another. Teachers were complaining everywhere that they found great difficulty in teaching penmanship. The average class could show every possible slant from backhand to the Spencerian slant. Sometimes a pupil would illustrate all these slants in a single line of writing. Lack of uniformity in the slant makes writing illegible and ugly. Hence, our crying need was a uniform style for the entire city, which, however, was not required until twenty years later.

The Natural Slant. In the period referred to above very little scientific work had been done on

the writing movement. Science had concerned itself up to that time chiefly with the hygienic point of view. The writing masters, the public, and the school authorities expended much energy in a violent debate on the relative merits of vertical and slant. In this controversy the stock arguments on both sides were little more than personal or group opinion. Smith preferred vertical writing because he liked it. Jones voted for slant for the same reason. It reminded one of Lincoln's saying: "For people who like that kind of thing, that is just the kind of thing they will like."

In 1900 Mr. Cloyd N. McAllister (42) made a study of "the best slope for writing." His conclusions may be summarized thus:

1. A slant of 48° permits the most rapid writing.
2. The hand acquires a slope that is farther removed from the vertical than the model used as a copy, a child usually deviating 10° .
3. The greater the slant to the right the more rapid will be the writing.
4. A slant of about 75° permits legible writing, but as the angle decreases below 70° the legibility decreases rapidly.
5. A base line is desirable to guide the eye in writing across the page. Other lines cause the child to give more attention to spacing and height than to form and movement.

6. As to size, each pupil should be permitted to use that which is natural to him.

7. Children, in first learning to write, use the finger and wrist movements, which produce small writing.

8. The full-arm movement, with elbow resting on the desk, is much more rapid than finger or wrist movement.

9. The finger and wrist movements permit round forms of letters, which are more legible, but require sixteen per cent more time than full-arm movement with rest.

10. Neither kind of movement should be used exclusively.

11. For small children much attention should be given to arm movement. For this training the brush may be used to prevent the firm grip and promote free movement.

12. Backhand writing is slow and difficult.

These results suffice to show that vertical script is not natural for a child, nor is it the most rapid. Consequently, when children left school and were compelled to write rapidly, they were unable to keep on writing vertically. They were therefore compelled to form a new set of coördinations and to break up the old habits. The result was disastrous and was responsible for the atrocious handwriting which finally led to the adoption of the present system of so-called "muscular movement" writing.

CHAPTER II

THE PSYCHOLOGY OF HANDWRITING

Writing is a psychophysical process. It is therefore difficult to make a clear distinction between the physiological and the psychological factors, since any act of writing involves both. For the sake of clearness in exposition we may, however, make the logical division here employed. We know that there can be no psychosis without the corresponding neurosis, although there may be physiological acts that do not involve mind, as, for instance, when a headless frog swims or responds to a stimulus. The mental and the physical elements are like the obverse sides of a coin. To know the coin both sides must be examined and for convenience we may study one side at a time.

From the point of view of subject matter handwriting is one of the manual *arts* and is primarily a form of motor training. The psychology of writing is therefore the psychology of *voluntary movement* and *habit*.

Voluntary Movement. Voluntary movement grows out of the various forms of involuntary movement, which have been classified as impulsive, reflex, and imitative. Countless movements of these

sorts leave their records in memory and when, finally, the nervous mechanism of voluntary muscular control is sufficiently matured, the child has the images of how it feels to make certain definite coördinations, and these guide the will in issuing the necessary fiat for the imitation of the movements desired.

“Writing, which is essentially a coördinated movement, has to be developed through trial after trial, with consciousness directed, not upon the movement itself, but on the visual images which appear as results of the movement. What one is thinking of is not the movement at all, but visual images” (35). This process involves memory and imagination and judgment. In writing from a copy the pupil glances at the model, gets a visual image of the form he wishes to make, then makes a coördinated movement which he thinks will produce the form desired. While he is watching the product of his pen, he compares the form he makes with the image of the model which he carries in his memory. If he writes slowly, he may glance at the model and at the pen point alternately several times while he is writing a single letter. If the space between the line he is writing and the model is great, the memory of the form is proportionately imperfect and the product of the writing defective. To facilitate the process of imitation, therefore,

the model should be as close to the line of writing as possible. To "learn" to write a letter means to fix the image of its appearance permanently in the memory, and to associate this image by many acts of repetition with the muscular image of writing it. When all the letters are thus associated thoroughly in the various combinations which occur in written discourse, entire syllables and words will become "organized" as unitary coördinations. When this is accomplished, a minimum of attention is sufficient to discharge the series of motor impulses which result in a written word. Writing has now become automatic, and henceforth the mind can attend to *what* is written and the nerve centers will attend to *how* the writing is accomplished.

Unconscious Imitation. Professor Daniel Starch (62) reports an interesting experiment on "Unconscious Imitation in Handwriting" which has a significant bearing on the teaching of penmanship. The problem is formulated in the following terms:

To what extent, if at all, is a person's normal handwriting modified by a model of script seen during the process of writing? Will a person who habitually writes a slanting script unconsciously make his letters more vertical when he writes from a vertical copy? And will a person who ordinarily writes a vertical hand unconsciously make the letters more slanting when he writes from a slanting copy?

The experimenter gave to each of 106 students of psychology in the University of Wisconsin a set of five leaves, as follows:

1. Directions to the student
2. A short paragraph of typewritten material
3. A paragraph of vertical script
4. A paragraph of slanting script
5. A paragraph of unusually large script

Not a word was said about imitation. Ostensibly the experiment was for the purpose of securing a specimen of handwriting. After the writing was finished only two said they had tried to imitate the writing of the copy. Their records were excluded. The majority had no opinion as to the purpose of the experiment.

RESULTS

The object of the typewritten model was to secure the normal handwriting of each subject for comparison. Slant was measured first, with these average results for the group as a whole:

1. Change from normal to vertical. 3.7°
2. Change from normal to slant. 3.6°
3. Total range of change. 7.3°

The class was then divided into three groups: *Vertical writers, extremely slanting, and a slant be-*

tween the other two. The average results of vertical writers were as follows:

1. Average inclination of normal.....85.2°
2. Average inclination of copy from vertical.....87.1°
3. Average inclination of copy from slant.....79.2°

Vertical writers were influenced more by slant than by vertical. The extremely slanting writers showed these results:

1. Average inclination of normal writing.....50.4°
2. Average inclination of copy from vertical.....53.8°
3. Average inclination of copy from slant.....48.1°

Slanting writers were influenced more by vertical than by slant. The moderately slanting writers had these averages:

1. Inclination of normal.....62.6°
2. Inclination of copy from vertical.....67.4°
3. Inclination of copy from slant.....60.0°

These were influenced more by vertical than by slant.

There was also a sex difference which is interesting and significant. There were in the class 28 men and 75 women. The comparison of their results is shown in this table:

	Men	Women
1. Average change from normal to- ward vertical.....	4°	3.8°
2. Average change from normal to- ward slant.....	2°	3.7°
3. Entire range of change.....	6°	7.5°

The influence of the two models upon women was 25 per cent greater than that upon men.

The size of the model had also an unconscious influence upon these writers, as shown in the following table:

Average width of letters in normal writing...	4.33 mm.
Average width of letters in copy from large model.....	4.85 mm.

The average width of letters in the large model was 6 mm. The large model had the effect of increasing the size of normal writing by 12 per cent.

Use of a Copy. This interesting experiment of Professor Starch explains certain well-known facts about the use of a copy. It explains, in the first place, why children make little progress in penmanship under a teacher whose handwriting is poor. It emphasizes the absolute necessity of requiring teachers to qualify as experts in the kind of handwriting they are expected to teach. Yet it is only within a few years that training schools for teachers made any provision for equipping their students with this necessary skill. And of the teachers now in the service, how many are expert writers? Perhaps not more than fifty per cent. Need we wonder why penmanship teaching is unsatisfactory?

The experiment in unconscious imitation explains also why, in writing a copy, each successive line is less and less like the original copy. We used to have

copy books with ten or a dozen lines, and only one copy at the top of the page. When the pupil had finished a page, one could see a regular gradation downward, the last line being little better than a scrawl. The pupil had unconsciously imitated his own writing instead of the copy on the top line.

The copy books now in use are an improvement upon the old style. They have fewer blank lines, and frequently the copy is on a slip which is moved down on a sheet of paper as the writing progresses. Thus the imperfect copy of the pupil is covered, and only the standard copy is in view.

In my own district no paper copy is used at all. The lesson is written on the blackboard in the presence of the children. They thus obtain a visual image of the movements involved. If they are drilled in "air writing," they add to the visual image a muscular image. We have therefore developed kinaesthetic ideas of movement and visual memories of form and movement before the child touches paper with pen.

Miss Mary E. Thompson (66) thinks the copy book may profitably be used as a corrective of form, "as the dictionary is the standard consulted when one is in doubt about the spelling of words." But she says the best form of practice is the life form, or the expressing of one's own thoughts in writing while thinking. Most writing masters will agree

that the application of writing in correlation with other subjects is the real test of the success of the writing teacher; but if Miss Thompson means that a pupil may become expert in penmanship merely by doing written exercises in the content subjects and without formal drills as such in handwriting, I for one disagree. This is the old doctrine of "incidental learning" which the famous Committee of Ten invented years ago. We have not yet recovered from the blighting influence of that pernicious doctrine.

Sensory Control in Movement. We have already called attention to the fact that writing is voluntary movement, but that when we write, what we think of is not movement at all, but visual images. "If we introspect an act of writing we shall find that we never look at the movements of our fingers, but at the letters just written; and yet, if we watch some one else write, we will find that the eyes move but little and do not follow the form of each letter, but seem to keep track in general of where he is, to preserve the alignment and spacing, to keep an equality in the letters, and to avoid losing his way when in the midst of a word and so misspell it." Hence we conclude, says Woodworth, "that in forming the letters we come to depend mostly on the *muscular* and *tactile sensibility*. . . . In short, it may be said that the general and coördinating con-

trol necessary in making one line equal to another is left entirely to the eye when that is used" (66).

Handwriting as Habit. When we consider the physiological aspect of writing, we call it "organizing a movement." When we think of the mental side, we call it habit formation. Concerning the value of habit as a basis of practical teaching, modern psychologists have given us many useful hints. Habit, as Mr. Bryan (7) reminds us, does the following things:

1. *Simplifies movements* by eliminating useless motions. Diffusion of effort involves a great loss of energy and results in unsuccessful movements. When a child first learns to write, he energizes a great many muscles not needed in the process. After writing has been made automatic, only the necessary muscles are used.

2. *Makes for accuracy.* While the child is self-consciously trying to get a group of muscles to act in harmony the resulting movement is always crude and inaccurate. This is *one* of the reasons why the early attempts at writing are so unsuccessful. Even if the pupil correctly sees the form he is trying to imitate, he is unable to make his muscles execute his intention. Only by long practice is he able to reduce the process to habit and to achieve complete success.

3. *Reduces fatigue.* Diffuseness in movement is

tiresome because of the needless expenditure of energy. The young writer grips his penholder and holds many of the larger muscles of the body taut that are not concerned in the movement at all. Hence he soon tires. Habit corrects this overuse of energy and thus reduces fatigue. Conscious control of muscles requires attention. Habit hands the movement over to the lower centers and takes it out of consciousness. Walking is a very serious business to a child who is just learning how to do it. To the adult it is so nearly automatic that he can dodge automobiles and carry on a conversation at the same time.

4. *Follows the laws of habit formation.* Since writing is mentally a process of habit formation, it is important to keep in mind the laws of that very important function. William James enumerates three of these laws. As quoted from Professor Bain, they apply to moral habits only; but actually they apply to the formation of any habit, handwriting included.

(1) The first law of habit is: *We must launch ourselves with as strong and decided an initiative as possible.* "Accumulate all the possible circumstances which shall reinforce the right motives. . . . In short, envelop your resolution with every aid you know." This opens up the question of motivating

writing drills. Innumerable devices have been employed for this purpose, e. g.:

(a) Plot the individual scores of children and let them follow their own progress.

(b) Charters suggests a "writing hospital" to which pupils are sent until they are convalescent (10).

(c) Stone (63) has a plan which puts all pupils of the school into four groups for the writing lesson. The groups are the average, above the average, below the average, and the exempt.

(d) Have the pupil understand that the real test of his writing is his spelling, composition, arithmetic, and other written exercises of the day. The formal writing lesson is for the purpose of learning how to do his applied writing successfully.

(e) In the primary grades all sorts of simple devices may be used, such as honor lists, a blue ribbon or string tied to the penholder, unfailing praise for successful achievement.

(2) The second law of habit is: *Never suffer an exception to occur till the new habit is securely rooted in your life.* "Each lapse is like the letting fall of a ball of string which one is carefully winding up; a single slip undoes more than a great many turns will wind again." This law is violated when we permit a pupil to practice a wrong form or movement, or when he unconsciously imitates the bad

writing of a teacher. "Habit is habit," says Mark Twain, "and not to be flung out of the window by any man, but coaxed downstairs a step at a time." Mr. Joseph T. Griffin, one of my principals, writes:

Children write on an average three hours a day, which is fifteen hours, or 900 minutes, a week. They have a penmanship lesson formally prescribed for 80 minutes a week. In this formal exercise they write carefully, anxiously, elaborately. During the other 820 minutes when they are writing, their minds are not on the penmanship, but on the arithmetic, the grammar, the history, or geography which is the subject of the lesson. They write freely, hastily, and usually execrably. The habit formation is taking place there and no painstaking formal exercise in penmanship can offset the harm of scribbling during the other periods.

Every written exercise should be a lesson in penmanship.

(3) The third maxim is: *Seize the very first possible opportunity to act on every resolution you make, and on every emotional prompting you may experience in the direction of the habit you aspire to gain.* "With mere good intentions, hell is proverbially paved. . . . There is no more contemptible type of human character than that of the nerveless sentimentalist and dreamer, who spends his life in a weltering sea of sensibility and emotion, but who never does a manly, concrete deed." In short, here we invoke the law of effort. If we fail in the case of some pupils to motivate writing drills according

to the first law, the drills must nevertheless be done. When the law of interest fails to achieve our purpose, then we apply force. Children will have to learn that we live in a world where we can not always do only what we like. Many hard and disagreeable things must be done by people who would rather be doing something else. The dead must be buried, sewers must be cleaned, dishes must be washed three times a day. It is just as well to let children know from the start that some parts of school work are not very interesting, but that they must nevertheless be done. Among these are penmanship drills, the multiplication table, dates in history, spelling, and the like.

GRAPHOLOGY

1. **Its Elements.** Graphology is the science of estimating character or of determining personality by studying handwriting. The basic elements of this science are:

(1) That handwriting is a form of dramatic expression like gesture, bodily posture, and facial expression.

(2) That handwriting individuality is of central origin—that *handschrift* is *hernschrift*. The great individual variation in the time at which handwriting sets or matures with the consequent fixation of style is one of the most interesting aspects.

(3) That control of handwriting in such elements as relative proportion between one and two or three space letters, continuity of writing, mannerisms in dotting the *i*, etc., remains constant and cannot be disguised.

(4) That variability within certain limits is a sign of character. It is impossible for a man to make two signatures exactly alike. One of the proofs of forgery by tracing consists in the exact reproduction of a signature.

2. Graphological Methods. The methods by which graphology arrives at its conclusions are briefly these:

(1) *The method of analogy*, as when it is inferred that a connected handwriting indicates continuity of thought, while frequent breaks in writing imply intermittent flashes of inspiration, or when small writing is assumed as evidence of a love of minutiae.

(2) *An appeal to psychological principles*, e. g., the law that every mental state tends to issue in some form of expression, or the law that force and energy of movement (like size and pressure of writing) are a direct outcome of mental energy.

(3) *Empirical observation*, as when we compare the writing of a group of intellectually superior persons with that of the intellectually inferior; or the writings of criminals with those of moral reformers. Binet found that age could be deter-

mined in this way within an average of ten years, and sex in from 63 to 90 per cent of cases.

(4) *The method of intuition* abandons the analytic for the synthetic method. In this case the writing is judged on general impression. Some people have great ability in this line quite apart from any training. A test conducted by Osborn revealed a wide range of variation; namely, from 100 per cent of accuracy to 65 per cent (50).

(5) *Experimental graphology* is an attempt to apply the scientific method to the subject. It differs from experimental psychology of handwriting principally in the fact that graphology deals entirely with the product while psychology deals with the movement. Graphological inquiry has dealt with:

(a) The influence of external factors (pen, ink, paper, etc.),

(b) The range of individual variation dependent on subjective conditions (mood, emotional excitement, etc.),

(c) The range of graphic control to determine what elements may be easily modified and which resist all attempts at disguise.

(6) *Pathological writing*, which has for its object the diagnosis of disease. For instance, Dr. E. W. Scripture (57) reports a case of "penmanship stuttering." A patient, thirty-eight years old, had been

a stenographer for eighteen years. Then after three years of illness he secured a position as teller in a bank. His writing was poor, and was complained of by his employers. When other clerks were promoted, he was passed over. He tried in vain to improve his penmanship and became extremely nervous. When he arrived at his bank in the morning, a nervous fit would seize him and his writing became almost illegible. The treatment for his trouble was like that for stuttering. He was given a new alphabet similar to hieroglyphics. At first he wrote with a brush, then gradually the old alphabet was substituted. As long as he thought he was doing it in the new way he was successful.

3. The Graphologist and the Scientific Investigator. Unfortunately not many of these graphological claims have been verified by experimental tests. Miss June E. Downey (14) has assembled, in a very interesting and learned volume, facts concerning the present status of the science, and has made some original contributions of her own.

Significance of size. But the conclusions of the graphologist and of the scientific investigator are seldom parallel. For instance, with reference to the *size of writing*, the following are the findings of the several methods of inquiry (14:45):

(1) *Graphological.* Large writing means pride, ambition, imagination; spaced writing indicates

clearness, generosity; small writing means love of detail, critical acumen, pedantry, finesse; compressed writing suggests parsimony, self-centeredness.

(2) *Mechanical*. Size depends largely on the system of writing employed. It is greatly influenced by pen, paper, etc.

(3) *Pathological*. Psycho-motor excitement is shown by increased size of writing; automatism leads to increase of dimension; loss of motor control may be masked by increased size; psycho-motor improvement results in reduced writing; fatigue may lead to reduced size.

(4) *Experimental*. Increased size accompanies increased nervous activity; automatic writing produced with distraction of attention shows increase in size; script produced with eyes closed is usually larger; decrease in size is associated with lessened speed; it comes when effort is involved or when attention is directed toward movement; it is an outcome of *intentional* increase in speed; disguised writing is often reduced in size.

From this exhibit it is evident that the graphological position is largely based on assumptions which await verification.

This statement, however, does not apply to the methods of the handwriting expert in identifying handwriting and penetrating disguises for legal purposes. Osborn (51) gives us a most illuminating

account of the mechanical appliances used by these experts, such as the document microscope, the enlarged photograph, and delicate scales for determining line width, degree of curvature of connecting lines, and similar graphic details. That these methods are reliable is attested by hundreds of legal battles whose outcome turned on evidence of handwriting experts. The writer has himself had experience with anonymous letters written by teachers. Experts in each case picked out the guilty parties by examining more than half a hundred specimens of writing. In each case authorship was denied until the defendant was confronted with the evidence at the trial, when full confession was made.

School Intelligence and Handwriting. What correlation is there between general school achievement and skill in penmanship? Mr. Arnold L. Gesell (26) has made a study of this question and also of the relation between sex and handwriting. On the basis of 12,600 specimens of handwriting selected from the school children of Worcester, Mass., he concludes that:

1. For large numbers of cases, accuracy in the writing of elementary pupils tends to vary directly with school intelligence.
2. From the fifth grade through the high school, girls write more accurately than boys.

3. Boys show a tendency toward incoördinated writing in all grades.

4. Sex differences in writing become marked about the age of ten, and are largely attributable to mental qualities. Similar sex differences were discovered in spelling ability by Cornman (11). Boys show a motorial incoördination of 54.8 per cent, while girls have only 44.8 per cent. This excess of error by defect of motor process on the part of boys, says Cornman, may be accounted for by the direction of their attention to the completion of the word as a whole, while the superiority of the girls may be conversely ascribed to their care in the formation of each letter. The same considerations account for the fact that boys write more words than girls, but girls are better spellers.

(5) If writing is an index, then painstaking or careless qualities in a motor function bespeak in pupils of the elementary grades the same qualities in general school work.

This study was made before any of the handwriting scales were in existence and before most of the intelligence and achievement tests now familiar to school men had been constructed. In these measuring instruments we have a simple and much more reliable method of ascertaining the correlation between school intelligence and handwriting ability than Gesell had at the time of his investigation.

CHAPTER III

PRINCIPLES DEDUCED

1. FROM PHYSIOLOGY

1. We may roughly divide the development of handwriting into three stages, the *imitative*, the *formative*, and the *confirmed* or *settled*.

2. The writing process is a very complex coördinated movement, which may be resolved into:

- (1) Finger movement.
- (2) Hand movement from the wrist as center.
- (3) Arm movement from the elbow as center.
- (4) Arm movement from the shoulder as center.
- (5) Pronation.

3. The variety of combinations of these several movements and the preponderance of one or the other lead to individuality in handwriting. There is no one combination which is best for all.

4. Writing at first is a coördinated movement of the voluntary kind. This means that many different muscles must be energized at just the right moment and with an exact degree of strength if the movement is to be successful.

5. This harmony of action can be achieved only by long and careful practice. The object of the

learner has been accomplished only when what was at first voluntary coördination has become involuntary or automatic.

6. Diffusion of effort is one of the early difficulties of the learner. He energizes groups of muscles which are not needed in writing. "Nature attacks her problems of development by producing more than she needs and then picking out the best. Development means the selection of the right movements out of a total mass of diffuse movements" (Judd).

7. The wrist should be inclined not more than 45° (Freeman).

8. The hand should be supported on the third and fourth fingers (Freeman).

9. The writing arm should be perpendicular to the line of writing (Freeman). To effect this the paper must be turned so that the lower left-hand corner points toward the body.

10. The penholder should be held loosely and in such a way that the forefinger is below the thumb (Freeman).

11. Good writers use more arm movement than poor writers, although finger movement is also employed by most good writers (Freeman).

12. Good writers move more easily along the line than poor ones (Freeman).

13. "The good writer divides the writing movement into a series of units, corresponding to the natural units of form of letters, more radically than does the poor writer" (Freeman).

14. The whole-arm movement in the primary grades is harmful and violates the principle that nothing should be taught at one stage that must be unlearned at a later stage (Palmer).

15. Investigators disagree as to the correct procedure in primary grades. Some would stress movement and speed, deferring form to a later period; others would stress form, postponing speed and movement to a later period.

16. Nutt's experiments indicate that arm movement should not be stressed before the age of nine or ten.

17. "Pupils who make high grades in quality do not use a large amount of arm movement more commonly than do poor writers" (Nutt).

18. Considerable correlation exists between speed and arm movement; "but many finger-movement writers write with as great a speed as any arm-movement writer" (Nutt).

19. Several experts believe that the extensive use of formal "push-pull" and oval drills is a waste of time. They secure all movement drills through exercises in letter formation (Houston, Mills).

20. Rhythmic movement increases naturally with age.

21. Nutt found no correlation between rhythm and quality; but Freeman suggests that there may be advantages which are offset by disadvantages.

22. There is a decided correlation between rhythm and speed, and rhythm "resembles speed in that an extreme degree of it is probably unfavorable to form" (Nutt).

23. McAllister found that a slant of 48° permits the most rapid writing.

24. The hand acquires a slope that is farther removed from the vertical than the model used as a copy, a child usually deviating 10° (McAllister).

25. The greater the slant to the right the more rapid will be the writing.

26. A slant of 75° permits legible writing, but as the angle decreases below 70° , the legibility decreases rapidly (McAllister).

27. A base line is desirable to guide the eye across the page. Other lines cause the child to give more attention to spacing and height than to form and movement (McAllister).

28. As to size, each pupil should be permitted to use that which is natural to him (McAllister).

29. Children, in first learning to write, use the finger and wrist movements, which produce small writing (McAllister).

2. FROM PSYCHOLOGY

30. From the point of view of subject matter, handwriting is one of the manual arts and is primarily a form of motor training. The psychology of writing is therefore the psychology of voluntary movement and habit.

31. A study of "unconscious imitation" by Starch proves that one's writing is largely affected by the model, even when there is no intentional imitation. This shows the importance of requiring the teacher to be an expert in the kind of writing she is expected to teach.

32. Starch's experiment explains also why a child's writing in a copy book that has many lines declines regularly and ends in a scrawl on the last line. A movable copy slip which hides the pupil's own writing and always keeps the correct copy in view is better than a copy book.

33. A copy book or copy slip may be used as a corrective of form; "as the dictionary is consulted when one is in doubt about the spelling of words" (Thompson).

34. In forming the letters we depend chiefly on the *muscular* and *tactile* sensibility; but the general and coördinating control necessary in making one line equal to another is left entirely to the eyes (Woodworth).

Writing is an example of habit formation; hence

the following laws of habit should be recalled in this connection:

35. Habit simplifies movement by eliminating useless motions.

36. Habit makes for accuracy.

37. Habit reduces fatigue by eliminating diffusion of effort.

38. In habit formation we must launch ourselves with as strong and decided an initiative as possible. This points to the necessity for motivating our writing drills.

39. Never suffer an exception to occur till the new habit is securely rooted. This law is violated when we permit a pupil to practice a wrong form or movement.

40. The law of effort must also be invoked. If we fail to motivate drills through direct interest, then indirect interest, or effort, must be employed. The pupil must learn that some uninteresting things in life must nevertheless be done.

41. Graphology is the science of estimating character or of determining personality by studying handwriting. A branch of this science is concerned with the identification of handwriting in legal or criminal cases (Downey).

42. Certain elements of handwriting, such as relative proportion between one and two or three space letters, continuity of writing, mannerisms in

dotting the *i*, etc., remain constant and cannot be disguised (Downey).

43. Binet found that age could be determined by handwriting within an average of ten years, and sex in from 63 to 90 per cent of cases (Downey).

44. Pathological writing is writing used to diagnose disease. "Penmanship stuttering" is an illustration (Scripture).

45. Writing is largely affected by *external* factors (pen, ink, paper, etc.) and by *individual variation* dependent on subjective conditions (mood, emotional excitement, etc.) (Downey).

46. For large numbers of cases, accuracy in the writing of elementary pupils tends to vary directly with school intelligence (Gesell).

47. From the fifth grade through high school girls write more accurately than boys (Gesell).

48. Boys show a tendency toward incoördinated writing in all grades (Gesell).

49. Sex differences in writing become marked about the age of ten (Gesell).

50. If writing is an index, then painstaking or careless qualities in motor function bespeak, in elementary pupils, the same qualities in general school work (Gesell).

CHAPTER IV

METHOD IN HANDWRITING

Materials of Writing. All experience of writing teachers and supervisors emphasizes the importance of providing the pupil with the right kind of writing materials. Experimental investigations prove (Proposition 45)¹ that the quality of writing is largely affected by external factors, such as pen, ink, and paper, enumerated below, and by individual variations dependent upon subjective conditions, such as mood and emotional excitement. The case of "penmanship stuttering" cited on page 55 illustrates what emotional excitement may do to a writer.

1. The seat should be of the proper height. The pupil should be able comfortably to put both feet squarely on the floor while he is sitting.

2. The desk should be of the proper height. It will be about right if the pupil, while sitting erect, can comfortably rest both forearms on the desk.

3. The pen and ink must be right. When everything is ready, you may take your position at the desk and have it understood that you will be "at home" to try pens for a few minutes. Every pupil

¹ The propositions referred to in this chapter are found in Chapter III.

now makes a careful trial and inspection of his pen. If he thinks it is worn out, or if he is in doubt about it, he comes to you. A line is formed on your left of those who have doubtful or poor pens. You carefully try each pen; if you find one that is worn out, you give the pupil a new one. You have previously attended to the ink, which must not be too thin nor too thick, but just thin enough to flow freely, and as black as possible. Pupils frequently say, "My ink is black." That is its chief merit; the trouble is that it is too thick to flow. No pupil can write well with either paste or water. To keep the ink in proper condition all the inkwells should be covered, and they should be filled probably twice a week. Several times a month they should be thoroughly cleaned.

4. The paper must be right. I have seen children try to write on paper of such poor quality that it behaved like a blotter. It is a good plan in drill work to fold the paper vertically into two or three equal parts, and then shift it to the left on the completion of each division, so as to maintain uniformity of slant.

5. The ruling should consist of a base line and no more (Prop. 27). Over exactness in early writing seems to violate the principle that we should teach one thing at a time. If the pupil writes on elaborately ruled paper, he feels as if he were walking on a

tight rope. In every direction he is liable to make a false step and go to his doom. A further objection to excessive ruling is that it deprives the pupil of the opportunity of exercising his judgment. If the eye, unaided by lines, is compelled to decide height and slant and length, the pupil receives more mental discipline from his writing lesson than he would if all these things were determined by mechanical devices.

6. The position of the body must be right:

(1) Both feet flat on the floor.

(2) Head erect.

(3) Body bent slightly forward from the hips.

(4) Both elbows on the desk.

7. The holding of the pen is important. Diffusion of energy usually causes the pupil to grip the holder very tightly and thus the hand soon tires. Most children grasp the pen too near the end. (Prop. 16, 37). The pen should be held lightly (Prop. 10) and in such a way that the forefinger is below the thumb (Freeman). The wrist should be inclined not more than 45° (Prop. 7). The hand should be supported on the third and fourth fingers (Prop. 8) and the writing arm should be perpendicular to the line of writing (Prop. 9).

Other Essential Steps. After the external factors have been properly looked after, the actual teaching begins.

1. The mental process of learning to write offers no exception to the general law of learning. The "steps of the recitation" apply in this subject as well as in history, geography, and the other content studies. In a well-ordered writing lesson there is *preparation*, followed by *presentation*, *comparison*, and *deduction* or drill.

(1) The preparation is the analytical study of the copy or standard form to ascertain its elements. The first steps should usually be performed by the teacher and the class on the blackboard.

(2) The presentation is the process of uniting the elements thus obtained into the forms which the child is to practice.

(3) The third step is the stage of comparison, or the criticism of the learner's efforts. Has he succeeded? In what respects has he failed? The pupil should be trained to make these criticisms himself, and thus even a lesson in penmanship cultivates the power of reflection. Appeal to the child's own sense of symmetry. "Compare his irregular letters with his own regular letters. Show him how to try again on the basis of his own past efforts. In short, substitute a living, rational teacher and a self-criticizing pupil for a lifeless copy" (35:234).

(4) The fourth and last stage is the practice, drill, or test. This is usually best obtained in the

written work of the school outside of the writing period. Hence constant attention should be paid to the penmanship in composition, dictation, and other written exercises. There is just as much reason for observing this rule as there is for observing the rules of grammar in the oral and written language of the classroom. In none of his writing should the pupil be allowed to fall into careless habits. Even his notebooks should be regularly inspected by the teacher and criticized as to accuracy and neatness.

2. It is of the utmost importance that the teacher's blackboard writing be as nearly perfect as possible (Prop. 31). Care should be taken that the pupil use the copy as a model rather than his own writing (Prop. 33) when he is asked to test the accuracy of his product.

3. Nothing is more fatal to progress than to permit pupils to practice wrong forms (Prop. 39). Therefore individual criticism of pupils is indispensable. No teacher can successfully teach writing by sitting at her desk.

The Writing of the Youngest Pupils. Many points concerning the beginnings of writing are still in the controversial stage, because they have not been settled by scientific inquiry.

1. *When to begin.* The first question is, When should a child begin to write? He now begins in

the first grade. He does the same in number work, but I have proved to my own satisfaction that all the time devoted to formal teaching in the first grade is wasted (64). It is quite possible that time devoted to formal lessons in writing is also wasted. The child's growth in maturity during the first year enables him to recover easily during the second year all the number work he missed during the first year. His growth in motor control may have a similar effect upon his handwriting.

Thompson (66:86) says a child should begin to write when he is physically fit and when he needs it. As our schools are now organized he has very little use for writing during the first year except in arithmetic, and if numbers were omitted, that need would disappear. I do not believe anyone would claim that we have as yet ascertained when a child is physically fit to write. That he *can* learn to write at six is certain, for he is doing it. But whether that is the most favorable time is a question for future experiment to determine. Indeed, Thompson says "the child is not physiologically fitted to learn to write until the ninth or tenth year at least" (p. 89). It would require rather a radical reconstruction of our school practice to postpone writing so long.

2. *Fundamental to accessory* (8). F. N. Freeman (20) has examined the contention that children

should use only the large fundamental muscles in school exercises and has come to the conclusion that the theory is not well founded. He cites numerous facts, open to common observation, showing that children use the small or peripheral muscles from the very beginning. Then he sums up in this fashion:

Since the development of the child's general capacity in movement cannot be adequately described in terms of fundamental-accessory movement theory, we must seek to define it in other terms. Experimental evidence has clearly demonstrated that there is a marked development in movement in a number of respects. The *steadiness* with which a child of six can maintain any position is increased fourfold by the time he reaches the period of youth. *Precision* of movement is relatively deficient in the young child. In *speed* of movement there is an increase which is represented in tapping with the fingers by more than two in a second. The ability to make a *complex* movement, such as tying a knot, is noticeably deficient in a young child (p. 52).

From these facts he deduces the following practical rules:

(1) "In lower grades, the writing period should come at a time when the child is not already fatigued."

(2) "Too great precision should not be demanded."

(3) "A pen should not be used at all to begin with. The first pen should be coarse."

(4) "The penholder should be of some material which can be easily held in position, such as cork or soft rubber, and should be of a medium size, smaller than that used by the older children."

(5) "The surface of the paper should be hard enough so that the pen does not easily stick into it."

(6) "It is obvious to an observer of young children that . . . they contract too strongly the smaller muscles which control the fingers. It becomes necessary, then, to counteract this tendency to overuse by laying emphasis upon the use of the movements of the arm." This may be done by rhythmical movements to count or victrola music. "Rhythmical movements are known to produce much less fatigue than movements which are irregular."

(7) "The writing of the beginner should have two characteristics. It should be very large, and it should be done with the arm as a whole rather than with the fingers. It is clear that a large letter can be made with much less precision than a small one without producing any greater departure from the true form of the letter. These two requirements of size and arm movement are met in the highest degree by blackboard writing. When the conditions make it impossible for the child to make the whole-arm movement properly, the next best procedure is to use the arm movement with rest and

require the child to write as large as his arm will permit. It will be possible to obtain writing in which the one-space letters are nearly one-half inch in height."

I have quoted extensively from Mr. Freeman because he has given more time and attention to experimental work in handwriting than any other person in America. His demand for whole-arm movement is undoubtedly sound. Exaggeration of size and movement in handwriting has the same effect as the magnification of a flower or insect by a lens. It impresses the form of the letter and the nature of the movement more clearly and more vividly upon the mind. The only difference of opinion is on how long this exaggeration should continue. We have seen (Prop. 14) that the whole-arm movement does serious harm if continued too long. It is my opinion that the large writing on paper should not extend beyond two or three months; and that by the beginning of the second half of the first year the writing should be of normal size.

(8) Nutt's experiments (Prop. 16) indicate that arm movement should not be stressed before the third year of school. In New York there are no movement drills prescribed by the Syllabus before the 2B grade (second half of the second year). McAllister found that children, in first learning to

write, use the finger and wrist movements (Prop. 29). In St. Louis arm movement is stressed from the third year.

3. *Form of the movements.* The question as to what should be the form of the movement drill when it is introduced is important. We have seen that two prominent supervisors (Prop. 19) believe that the drills should be on letter or word forms rather than on abstract lines and ovals. The principle involved, it will be noticed, is the same as that which is now applied to manual training and other subjects, the principle of correlation. Formerly the pupil was occupied in making joints and dovetails, in smoothing and shaping and rounding pieces of wood. None of these exercises led to a definite practical end in which the pupil was naturally interested. Now the manual training teacher has his pupil employed upon the construction of useful articles. The product is a completed thing whose value the child appreciates. All project work embodies the same principle. Even the music teacher has discovered that it is better to motivate practice by giving the pupil a "piece" from the start than to keep him indefinitely on dreary finger exercises.

4. *When shall we use ink?* Mr. Palmer thinks a six-year-old child is not too young to use ink. District Superintendent Rector, who has had exceptional experience to justify her opinion, says, "All

writing should be in ink. The only exception to this may be in arithmetic." In St. Louis the pencil is used for the first three years. We are thus again in the realm of opinion, because no experimental data are at hand. Until somebody proves something, you will like what you like and I shall do the same.

Writing in the Higher Grades. The following points are to be noted in a discussion of the writing of older children:

1. *Drills.* If we remember that writing is a very complex coördinated movement of the voluntary kind (Prop. 2, 4), the necessity for an abundance of drill of the right kind is at once apparent. The object of the *writing* drills is to make the movement automatic (Prop. 5). Investigations prove that we must expect children to use various combinations of finger, arm, and wrist movements (Prop. 2, 3), but that the good writer uses more arm movement than the poor writer (Prop. 11). Hence the forearm movement drills should be stressed in all the upper grades.

2. *Motivation.* These drills should be motivated by all kinds of devices, some of which are discussed elsewhere (see pp. 121, 170). One of the most potent of these is the exemption of pupils who have reached a certain standard. "Every test," says Freeman (20:150), "of the ability of pupils in

handwriting brings out the fact of a large amount of overlapping in the successive grades. Many children are superior in attainment to the average of attainment of several grades above them. If the children were given an additional incentive to improvement by being granted exemption from the writing lesson on promotion to a higher grade as soon as they had attained the standard of the second grade above them, many of them would soon attain this degree of efficiency."

3. *Speed and quality.* "In general," says Thompson (66:57), "movement loses accuracy as speed is increased, but it is not true that equal increments of speed produce equal increments of error. . . . Therefore there is a lower limit beyond which decrease in speed does not conduce to greater accuracy. In the same way, at the upper end there is a limit beyond which increase in speed does not produce much further inaccuracy."

In the first survey of my own district the evidence was plain that we had developed speed at the expense of form in many schools. As a rule the proportionate increase of arm movement (Prop. 18) tends to increase speed. Rhythmic movement tends to improve both form and speed (Prop. 20, 21, 22).

"Rapidity," says Thorndike, "is in and of itself a good sign. If we know nothing about one score

or so of pupils save that they are rapid writers, and nothing about another score save that they are slow writers, we can prophesy that at the same rate the former groups will on the average do writing of a higher quality. . . . There is a close relation between the quality of writing at a natural rate and that at a slower rate." A group of children producing a quality of high grade at a rate of 33-37, inclusive, at the first test will produce a quality of high grade at a final rate of 52-60, inclusive. "The gain in quality which a pupil secures by writing more slowly than his natural rate is not great. Sixty-one pupils whose rate was from 52-58 words in four minutes, by reducing their rate to 32-36 words in four minutes (that is, by writing only two thirds as fast) gained on the average in quality less than one step of the scale."

4. *Remedial instruction.* Many writers on handwriting remind us that scales should be used for diagnostic purposes, and when we have ascertained what is the specific weakness of a pupil or class, instruction should concern itself with an attempt to remedy that defect. Gray's Score Card is an excellent device for locating a pupil's errors (see page 139).

5. *Sex in writing.* Girls are said to be more accurate in penmanship than boys (Prop. 47), who have a tendency toward incoördinated writing

in all grades (Prop. 48). This does not appear to have much practical bearing upon the problem in hand, except to furnish "an alibi" for teachers of boys' classes. But alibis don't get you anywhere, so where ignorance is bliss 'tis folly to be wise. The fact of the matter is that boys can and do learn to write well under a competent instructor. If it is any comfort for teachers of boys to know that their work is harder than that of their comrades who teach girls, they are entitled to that consolation.

6. *Time element in writing.* Concerning the length of practice periods, W. Smythe Johnson (33) reports the following interesting conclusion:

(1) When practice is carried on until the movements become irregular, the practice becomes injurious, for the irregular movements become incorporated into the chain of reaction as certainly as those which are purposefully directed. If wrong adjustments of muscles are made, and these gain a place in the chain of subconscious memories, then these adjustments delay the development of the control over the muscles for accurate adjustment.

(2) "Short periods of practice often repeated make for more rapid development of the accurate adjustment of voluntary movements than few periods of longer duration." Whipple (72:26) makes a similar observation: "Make the duration of your periods of study long enough to utilize a

warming up, but not so long as to suffer from weariness or fatigue." And again he says: "When drill or repetition is necessary, distribute over more than one period the time given to a specified learning." According to Thorndike (67) three school systems out of seven measured "get little or no better results at a time cost of about 75 minutes a week than two systems do at zero time cost; and one system, at no greater time cost than C, D, and E, gets results about 25 per cent better than they do; and practice for quality may secure it only at the cost of speed."

7. *Left-handed children.* What to do with left-handed children is still a debated problem. On the one hand it is argued that equipment for writing is made for right-handed people; therefore the left-handed writer is always at a disadvantage. A prominent educator known to the writer has four sons, all of whom were left-handed, and all of whom were compelled by their father to write with the right hand. Many writing masters and supervisors maintain that all children should use the right hand. Psychologists, on the other hand, are not so emphatic on this point. They recognize the fact that left-handedness is a fundamental physiological condition, and that in many cases the attempt to change causes disturbance of speech. They therefore advise that if a child is strongly

left-handed he should be allowed to use his left hand. If his preference is only slight, he may be urged to use his right hand.

8. *Group teaching.* Mr. Walker (70), who is supervisor of writing in the St. Louis Public Schools, has discovered, as every teacher has, "in every room above the third grade three distinct groups of writers—the good, the mediocre, and the poor." The first step in the attempt to adapt the instruction to the needs of children was to divide every class into three sections, known as A, B, C. The pupils changed their seats for writing lessons and each group received instruction on separate days, while the rest of the class were doing something else.

The next step was to organize three adjacent rooms so that all the A's were in one room at writing time, all the B's in another, and all the C's in another. This added much to the interest and the progress of the pupils.

Then the promotion idea suggested itself. Once a month there was a regrading. The best writers in the A group went to the C room and became *exempt* or *helpers*. The rest of the children were moved up as their proficiency warranted.

The plan was extended throughout the school and then to the city as a whole.

The advantages claimed are:

- (1) Very few failures.

(2) Percentage of good writers among boys greatly increased.

(3) The children are able to complete formal practice much earlier than formerly.

(4) Supervision is simplified.

(5) Instruction is simplified.

(6) Penmanship is motivated.

Teaching Illiterates How to Write. For the use of evening schools in teaching illiterates, Mr. Massell (65) and the writer devised a plan which has been successfully employed for four years. Since it is brief, it is quoted here in full:

The following course in *Teaching to Write One's Name in Three Lessons* is the outgrowth of experience in teaching illiterate adults how to write. This experience has convinced the authors that the short road to success is the tracing copy. That tracing is based on sound psychology needs no argument. By tracing, the learner gets an experience of how it feels to make the exact movement required. As O'Shea says, the pupil is unable to reproduce a form by simply looking at it, because "we see through our motor habits." By tracing a form, the pupil establishes a temporary motor habit which enables him to see what the form actually is.

Having decided upon the psychological foundation, the next step was to work out the details by experiment. The aim was to find the way in which an illiterate adult could be successfully taught to write his name in the shortest possible time. The experiment has convinced us that the result can be accomplished in three lessons.

1. *Educational value.* We have found the course useful in many ways. The illiterate adult, when he goes to evening school, often wants immediate results. Our course in writing

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one's name serves this purpose and incidentally becomes an incentive to further study.

Signatures are required in business, social, political, and religious life. Everyone is required, at one time or another, to write his name. The illiterate, by securing this very substantial help in three nights, sees that night schools have something valuable to offer him. Ability to write his name raises his self-respect, and adds to the security of his property.

2. *Method.* Each class has two teachers. No instruction is given in this class except that of writing one's name and address. When the pupil enters the class, his name in stencil form is made out by a teacher who is a good penman. The size of the writing is exaggerated in the first model and reduced to normal in subsequent lessons.

The pupil takes the copy and writes as long as he wants to during the evening. The second teacher supervises the seat work, giving help and encouragement where these are needed. In later lessons the pupil practices until the normal size and satisfactory performance are attained.

LESSON I

Writing by Tracing

1. The new pupil on entering the class gives his name.
2. The teacher writes the name on a piece of paper in slightly above normal-sized letters. Name to be written in a clear, bold hand so that the form of each letter and the connecting strokes are plainly visible.
3. The name to be written lightly with pen or pencil and to be repeated at least twenty times.
4. While the teacher is writing the copy, the pupil is to observe the teacher's position at the desk, the holding of pen and paper, and the writing movement.

5. The pupil is then directed to take his seat and a second teacher takes charge of him.

6. With a soft pencil the pupil, under the guidance and supervision of the second teacher, proceeds to trace the twenty outlines given.

7. Additional copies may be given to pupils who do not acquire facility in tracing by the twentieth time.

Lesson not to exceed a half hour in duration.

LESSON II

Writing from Copy

1. As a review, five copies are given for tracing.

2. Then a new sheet is given with one copy on it.

3. The pupil proceeds to copy below the original. This is to be continued until the pupil acquires facility. No more than three copies are to be permitted on one paper. Give a new copy then, so that the teacher's copy may be the model and not the pupil's own efforts. Time—not more than half an hour.

LESSON III

Writing from Memory—Application

1. Let the pupil copy his name three times. (Review)

2. Let the pupil write his name from memory.

3. Resort to copying, if difficulty is experienced.

4. Application: Signing checks, money orders, deposit slips, post-office removal notices, receipts, etc.

5. Write name on envelope.

Follow the same procedure in teaching one to write his address.

This course has been widely approved by business men, judges, lawyers, heads of city depart-

ments, editors (Frank Crane has written on it), officers of the post-office department, the naturalization bureau, banks, insurance companies, and the New York State Americanization Bureau.

Departmental Teaching. Some writing experts are of the opinion that handwriting cannot be taught successfully in the elementary school by the departmental system, for the reason that the formal writing lesson is only a small part of the writing situation. Unless pupils are held to correct posture, relaxation, pen holding, movement, etc., in all writing, they will never become good writers. This opinion, however, is not universally valid. I have seen writing taught with great success by the departmental plan in the grades, and in the secondary school it is necessarily so taught. In the St. Louis Survey it is recorded (Vol. 5, p. 226) that departmentalization in the upper grades has been successful. Careful tests showed that children so trained wrote almost as well in all of the grades and fully as well in two of them, when their attention was upon the thought which they were expressing, as when they were doing the formal writing lesson. This indicates that the writing habit is not confined to the writing lesson and is, therefore, an evidence of good instruction.

It is safe to assume that these results were achieved by the competent supervision of the principal.

CHAPTER V

EDUCATIONAL VALUE OF HANDWRITING

In order to be strictly in the fashion of the day, one ought to speak of the "objectives" of handwriting. But we elders of the profession who have lived through so many changes of fashion in educational lingo ought not to be chided if we exercise our individuality by affecting last year's style. What we meant yesterday and what we mean today is that there must be a reason for teaching penmanship. What is that reason? Only two cities¹ report serious consideration of the aims of penmanship teaching. As it is one of the traditional Three R's, its necessity has probably been generally assumed, and not much thought has apparently been given to the function of writing and its proper place among the hierarchy of studies. *Tacoma* says:

The purpose of penmanship . . . is that pupils may acquire efficient habits in a skill useful in varying degrees throughout life. . . . The most valuable by-product resulting from efficient penmanship training is, without question, that of self-discipline. This may be translated into such terms as neatness, relaxation, close observation, muscular coördinations, rhythmic response, appreciation of beauty, orderly thinking.

¹ All citations of practices and opinions of other cities are taken from answers to the writer's questionnaire on the Supervision of Handwriting referred to in Chapter VI.

The foes of Formal Discipline, please take notice!

St. Louis states the aim in these terms:

The chief business of the school is to assist the child in building up organized concepts of the world; to help him to make these concepts more definite, complete, comprehensive, and to give them adequate meaning. All the school subjects—reading, writing, spelling, arithmetic, music, drawing—grow out of and are subordinate to this organization of the child's imagery, to the end that he may gain greater control over his world. The only means by which the child may organize and complete his imagery is through expression. . . . Handwriting is one means of organization or interpretation; it should not be made an objective; it is a means to an end, a mode of expression.

The educational value of the several subjects in the curriculum, I think, might be roughly summed up under the following five heads:¹

First. Utilitarian Value

Second. Conventional Value

Third. Disciplinary Value

Fourth. Subjective or Interpretative Value

Fifth. Ethical Value

If you test subjects under these five heads, you will find that some have more of one than of the others. History, for instance, has conventional value. A certain amount of historical knowledge is assumed in the case of anyone who aspires to

¹ Parts of this chapter are taken from an address on "The Educational Value of Muscular Movement" delivered by the author in 1911, and published from stenographic notes by the A. N. Palmer Company. Copyright by the A. N. Palmer Company.

polite society. To be ignorant of the history of one's country would be a discredit. Not to have heard of Julius Caesar, or Socrates, or Napoleon, or the Duke of Wellington would be a serious slur upon one's intelligence. Such facts in themselves may have little or no practical value, but they have conventional value. Then history has also utilitarian value, for it enables the citizen to vote intelligently and to reason correctly upon social and historical themes. Again, history has subjective or interpretative value, for it enables one to understand what he reads in newspapers and books when historical persons or events are alluded to. Lastly, history has ethical value. Heroic and noble personages serve as ideals of character and incite the student to emulate unselfish and valiant deeds.

1. *Utilitarian value.* I think most people will admit that penmanship does possess this value, although some educators have spoken rather contemptuously of the subject. They have pooh-poohed writing as having no educational value at all. Some have even advocated the use of the typewriter in the classroom (as is done in schools and classes for the blind) so that writing would become again a useless art, as in medieval days, when it was regarded as an accomplishment beneath the dignity of well-bred people. When I was editor of the *New York Teachers Magazine*, I printed

an article from the pen of a Chicago school principal in which the writer solemnly declared that "the writing machine is coming into the public school. The children will be thankful," he said, "when they are relieved of such an immense amount of useless drudgery as the pen now imposes upon them." So we have had all sorts of extreme views concerning the slight value of penmanship as a school exercise from men in the highest places of authority in the educational world.

What is the utilitarian value of rapid business writing? Here is an excerpt bearing on this point written by the late Mr. Henry Clews, the New York banker:

I am always ready to consider applications for positions in my office from bright, intelligent boys from sixteen to eighteen years of age. Such boys should have had a complete course in the common schools, and should have some associates that will vouch for their good conduct and integrity. In my employ there are about one hundred and fifty young men, and they were all able to answer the requirements I have stated. I invariably ask young men to make their applications in their own handwriting, and I make my preliminary selections on the score of their chirography. I regret to say that the value of legible penmanship in this connection is often underrated in America. In England it is otherwise. There, writing of the copper-plate style is insisted upon. I would advise young men seeking positions to practice good penmanship. It is a valuable thing, almost a necessity. The first position that I held in New York was with Wilson G. Hunt and Company, who had advertised

for an assistant bookkeeper. I was told that I was engaged because of my penmanship. That was the beginning of my Wall Street career.¹

The fact that business schools flourish alongside of our free public schools shows that there is utilitarian value in penmanship, because the pupil comes here and pays to learn to write after we have wasted eight years in a vain effort to teach him the same thing. I am ashamed that the pupil should have to spend money to make up for our deficiencies. When we come to think it over, it is a wicked thing that we should devote eight years to an art so simple as writing, and then turn the pupil out with an atrocious writing habit and pass him on to the high school. The longer he remains in the high school the worse his writing gets. By the time he finishes his college course he is a hopeless scribbler. One of the worst jobs ever handed to me was a set of examination papers on the history and principles of teaching, written by college graduates. They were applicants for positions as teachers in our city high schools. When I had finished the reading of those papers, I realized most vividly the utilitarian value of penmanship. Before asking an examiner to rate papers written in such dreadful

¹ From the magazine, *Success*. Mr. Cameron Beck, Personnel Director of the New York Stock Exchange, who passes on the applications of several thousand boys applying for work each year, confessed to me recently that one of the most serious deficiencies of the boys is poor handwriting.

scrawls, the Board of Education should hire a clerk to transcribe the stuff by means of a typewriter.

Penmanship has further utilitarian value. During the early days of my superintendency, I examined certain schools and tested twenty or thirty classes in spelling. Every now and then, while the teacher was dictating the words, I remarked, "You are dictating too rapidly." And the teacher would say, "No, there is plenty of time." I had forgotten that they were "Palmer Schools," and that they were learning to write rapidly. I was thinking about the length of time it used to take to do spelling, before the introduction of arm-movement writing. I found I could save at least half the time it used to take to dictate ten words in spelling. Now, as I examine five or six hundred classes in spelling every year, it is plain that business writing has utilitarian value to me. It gets me out of the school more quickly; and it has utilitarian value to the teacher, because she is very anxious to get rid of me!

I went to one of my schools not long ago and observed a teacher dictating a paragraph from Daniel Webster. We timed the children. The slowest pupil in class did it in six minutes. I know that twenty years ago any teacher in New York would have spent forty minutes on that exercise. In one of Dr. Maxwell's reports of that day he

criticizes our dictation and makes the statement that in many classes forty-five minutes is consumed in the dictation of four lines of poetry. It was true. I can prove it, for I did it myself!

2. *Conventional value.* Now, as to conventional value. This is a value apart from any use one intends to make of the subject or art. It is negative. It is like spelling. No one receives any special credit for being a good speller, but it is a disgrace to be a poor one. Similarly, poor handwriting is a discredit. You judge people by their handwriting. While graphology is not yet wholly on a scientific basis (see page 56), nevertheless there are certain kinds of writing that people commonly would not associate with intelligence. On the other hand, when you see a good, free form of writing, you say that person has training.

3. *Disciplinary value.* Does writing possess disciplinary value? Professor McMurry proposes this thesis:

“Mental development should be expected as a very valuable by-product brought about in the course of the accomplishment of pieces of work that for other reasons deserve to be done.” The “other reasons” in the case of penmanship are its practical value and its conventional value. Does it possess also, as an incidental by-product, disciplinary value?

I do not know whether there is very much general development that comes from penmanship. It is not one of the traditional culture subjects like literature, history, mathematics, and philosophy. It is a school art. It is one of the nine modes of expression which formed so significant a part of the educational theory and practice of the late Colonel Parker. He taught us, following Froebel, that discipline or development is chiefly an outcome of expression. It is only by means of expression that the pupil becomes creative. While he is listening or reading, he is a mere sponge. When he expresses his ideas by writing or drawing or modeling, he selects his own language, rearranges his material, and produces something that is original.

Moreover, the cultivation of motor control is mental discipline, just as much as learning history, or literature, or logic. Writing belongs to the executive part of the soul. As Earl Barnes says:

A child, or a man, is a unit. Whenever a nervous system is so trained that it enables its possessor to cut to a line, to make a good chair, a good picture, or a good written letter, it has prepared the mind to think "twice two is four." Manual training is not drawing, and penmanship is not thinking, but any kind of good and accurate work trains the nervous system and the mind for good work in any other field of activity (4:389).

There are many subjects in the course of study that are not well understood by illiterate or slightly

educated parents. Whether nature study is well or ill taught in any given grade few laymen would be able to decide. The same may be said of elementary history and geography. Courses of study differ as to the grade where these subjects begin, the order of their development, and the method of teaching them. But any parent can tell whether a child writes well or ill; and satisfactory progress in this art goes far to persuade people that the school is doing satisfactory work in other things.

The ability to write a good letter is a measure that most people apply as a test of progress in school. The acknowledgments of gifts and greetings which children write to their friends always elicit a favorable or unfavorable comment on the part of the recipients of such letters. Beautiful and legible penmanship covers a multitude of sins. You will recall how Mrs. Wiggs of the Cabbage Patch, because her late husband had so few virtues, never failed to dwell on the fine hand he wrote. The only object we have in writing anything is to enable some one to read what we have written. Why should we not try to render the task of reading as easy and pleasurable as possible?

4. *Subjective or interpretative value.* I think we shall have to admit that penmanship has little value of this kind except as we use it to interpret

character and as experts use it in legal proceedings to identify the authors of forgery or the writers of anonymous communications of a libelous or criminal character.

5. *Ethical value.* I discovered, as a class teacher, that writing and drawing are among the most valuable aids in reforming "bad" children. If you succeed in making a troublesome child write a good copy, praise him for it. That immediately raises his self-respect and his respect for you. He will feel, even if he does not say so, "Well, my teacher does know how to teach writing." And if on a lucky day such a pupil should be selected as a helper to show other children how to write, his cup of happiness would be filled. It is a well-known fact that numbers of children who are inapt at book study and intellectual pursuits, take kindly to any kind of manual exercise. Hence writing, drawing, or shop work has been the initial step in the reform of many a delinquent.

6. *Time value.* How much is penmanship worth in terms of a 1500-minute time schedule? If the median time devoted to the subject is 75 minutes a week, that is 5 per cent of the school time. If the school year is about 180 days of 5 hours each, the total annual school time is 900 hours, and for 8 years it is 7200 hours. Five per cent of that is 360 hours, or 72 school days. Is that too much

time to devote to the acquisition of an art that has great social and vocational value throughout the life of an individual? In the writer's opinion the time is not excessive if the outcome is satisfactory. But unfortunately in many cases the harvest is so meager that it does not pay for the labor expended in its production.

The above statement, however, applies to other parts of the curriculum as well as to penmanship. For the distribution of skill among teachers is no exception to the general law of variability in nature. A certain proportion possess a median grade of ability, say 40 per cent, 20 per cent are above the average, 10 per cent far above the average, while about 20 per cent are below the average, and 10 per cent far below the average. It is inevitable that in the course of his career a pupil should fall into the hands of one or more incompetent teachers. It may be his luck to have a succession of them. And then again, many teachers are successful in other subjects but failures in handwriting, while a few are skilful in penmanship and poor in other subjects.

There are so many factors in the production of good writing that the time element alone may be an insignificant part of the entire situation. Among seven school systems examined, Thorndike found two that, while devoting no special time to handwriting, had penmanship equal in quality to that

of three other systems in which 75 minutes a week was spent on the subject. Dr. J. M. Rice discovered similar facts about spelling in 1897. Schools that devoted 60 minutes a day to the subject had no better spelling than those that employed only 15 minutes a day. For this reason Rice came to the conclusion that all spelling time in excess of 15 minutes a day is wasted.

In New York the official writing time is 75 minutes a week for the first six years and 60 minutes for the last two.

In St. Louis the first three grades have 80 minutes a week, the next three 120 minutes, and the last two 60 minutes. This is an average of 90 minutes for the eight years.

CHAPTER VI

THE SUPERVISION OF HANDWRITING

The Need of Supervision. The teacher seldom realizes how much of her success is due to efficient supervision or how much of her failure, where there is failure, is due to inadequate supervision. In fact, teachers have been known to ask, Why are supervisors? Why is a principal? Why is a district superintendent? Let other arts furnish the answer. Here is a comment on acting by John Peter Toohey, general manager of the Modern Theater Company, which produced Molnar's play, *Fashions for Men*. The extract is part of a letter published in Heywood Broun's column in the *New York World*:

You said that fine acting was largely a matter of inspiration; that experience helped the actor little, that practice helped him less, and intelligence not at all.

Because you write too plausibly and because I myself have never given the subject any real thought I believed you. Then the rehearsals for Molnar's *Fashions for Men* began and I had before my eyes a practical test of your theory. And now I tell you that you were utterly wrong. I can tell you that the acting which you praised so cordially in your recent review of the Molnar play was the result not of accident or inspiration but of careful, painstaking planning and preparation. The company—and it is a company of rather more than average intelligence—was started off largely on its own devices. Every player was

permitted to move and gesticulate and read as he saw fit. The result was chaos. Then, bit by bit, the director began to shape and revise the player's conception of mood, his idea of pace and pitch and emphasis, his scheme of gesture and movement. I was amazed in the end to see how little of the players' own conception remained.

This state of affairs is not peculiar to *Fashions for Men*. It is inevitable with every play that bears the remotest resemblance to life, for the actors are merely the voices of the orchestra, and however competent they may be individually they will fail to achieve harmony without the conductor's controlling hand. Here and there, to be sure, may come a solo passage for the first violin or the oboe wherein individual virtuosity may shine, but the bulk of the composition is a matter of teamwork, of absolute subordination to a harmonic plan.

Aye, there's the rub! Left to his own devices the actor is apt to treat every phase as a bravura passage. He is concerned with his own rôle and not with his proper place in the pattern.

Substitute "teacher" for "actor" in this passage, and you have a perfect description of what happens to a school where *every player is permitted to move and gesticulate and read as he sees fit*. The result is chaos. It is absolutely necessary to have a leader who decides where each actor's proper place is in the pattern.

On the same day in which the letter on acting was published, Mr. Deems Taylor, the *World's* musical critic, wrote this:

What *Parsifal* needs at the Metropolitan is not primarily better singers or better scenery or a better orchestra (Mr.

Bodanzky conducted a really eloquent performance), but a little more imagination. There seems to be no one in charge who combines the knowledge of what to do with the authority to get it done.

The weaknesses were individually negligible and collectively disastrous. The knights had been told what to do and did it; but they did everything together, as if fastened to a common string. The singers had obviously been allowed to choose their own costumes. Some of them, notably Mr. Bender's and Mr. Whitehill's, were perfect. Some were all wrong. Parsifal wore a simple, knee-length garment, just as Wagner said he should; but it is doubtful if Wagner had meant the garb to be cut and worn in such wise that Parsifal looked more like Anne Pennington than a Knight of the Grail. In the seduction scene Kundry wore a form-fitting, heavily beaded gown that looked gorgeous, but that clanked and tinkled at every move with the sound of glass portières. In her more impassioned moments she nearly drowned the orchestra.

Nor could one manage any emotion except that of mirth during the spear-throwing episode, when the spear, sliding languidly down its perfectly visible wire, slowed down obligingly and stopped with a jerk over Parsifal's head, waiting to be unhooked. And never, never, shall we become reconciled to a Kundry, meek, penitent, kneeling before Parsifal with her wild and abundant tresses perfectly marcelled.

There must be a way of doing these things differently. Perhaps, some time, the Metropolitan will discover it.

Here we have an accurate picture of a school with good teachers and a poor principal, "where weaknesses are individually negligible and collectively disastrous," because the teachers, though compe-

tent, "have failed to achieve harmony without the conductor's controlling hand."

It is an axiom in our profession that no school is any better than its principal.

CURRENT PRACTICE IN THE SUPERVISION OF HANDWRITING

Replies to questionnaire. In order to ascertain how penmanship is supervised at present in urban communities, the author addressed the following circular to one hundred and thirteen cities of fifty thousand inhabitants or over:

DEPARTMENT OF EDUCATION
THE CITY OF NEW YORK

Office of the District Superintendent
11 Hubert St., New York
Nov. 8, 1922

My dear Superintendent:

If you have a Director or Supervisor of Penmanship, please hand him this circular. If you have no such official, consign this at once to your waste basket.

To the Director or Supervisor of
Penmanship

Dear Sir or Madam:

I am trying to find the best way to supervise penmanship. Therefore I should be pleased to receive from you:

1. A brief general description of your method of supervision.

2. Any syllabus, instructions, circulars, or other documents issued by you.

Very truly yours,

JOSEPH S. TAYLOR,

District Superintendent of Schools
Districts 1 and 7

The following table gives the names of the thirty-five cities that answered the questionnaire:

THIRTY-FIVE CITIES REPORTING

<i>City</i>	<i>Supervisor</i>	<i>Syllabus</i>	<i>In Tchr. Tr. Sch.</i>
Baltimore, Md.	Joseph D. Noonan	Zaner System	—
Binghampton, N. Y.	Mrs. Elizabeth Landon	Zaner System	—
Boston, Mass.	Bertha A. Connor	Palmer System	—
Buffalo, N. Y.	Clara R. Emens	Palmer System	—
Chattanooga, Tenn.	Sammie Cleveland	Yes	—
Columbus, Ohio	Zaner-Boser Co.	Yes	Yes
Chicago, Ill.	None	No	—
Detroit, Mich.	Lena A. Shaw	—	—
Elizabeth, N. J.	G. G. Gudmundson	Palmer System	—
Flint, Mich.	Jean G. Farr	Palmer System	—
Grand Rapids, Mich.	Theodocia Carpenter	Palmer System	—
Harrisburg, Pa.	None	Yes	—
Hartford, Conn.	Louis H. Stanley	Yes	—
Houston, Texas	Anna Kelso	Yes	—
Lowell, Mass.	Margaret Garvey	Zaner System	—
Los Angeles, Calif.	R. E. Wiatt	Zaner System	—

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THIRTY-FIVE CITIES REPORTING—(Continued)

<i>City</i>	<i>Supervisor</i>	<i>Syllabus</i>	<i>In Tchr. Tr. Sch.</i>
Lawrence, Mass.	None	Yes	—
Newark, N. J.	Raymond C. Good- fellow	Zaner System	—
New Haven, Conn.	Harry Houston	Yes	—
Omaha, Nebr.	J. A. Savage	Zaner System	—
Providence, R. I.	Frances E. Watts	—	—
Rochester, N. Y.	Edward C. Mills	—	—
Reading, Pa.	Ethel Shelly	Palmer System	—
Richmond, Va.	W. C. Locker	Locker System	—
St. Louis, Mo.	H. C. Walker	Yes	Yes
Salt Lake City, Utah	Arthur J. Becker	—	—
St. Paul, Minn.	Yes	Bulletin	—
South Bend, Ind.	Cora A. Ney	Weekly outlines	—
Syracuse, N. Y.	C. S. Chambers	—	Yes
Springfield, Mass.	None	Zaner System	—
Scranton, Pa.	Hazel E. Smeed	—	—
Tacoma, Wash.	John O. Peterson	Outlines	—
Trenton, N. J.	Alice E. Benbow	Zaner System	—
New York, N. Y.	None	Yes	Yes
Worcester, Mass.	Margaret B. Toole	Bulletins	—

A personal letter from Associate Superintendent Oliver P. Cornman informs the writer that "we have now in Philadelphia a supervisor of handwriting who has been working in a few schools. . . . Next month we get five more supervisors, and year by year we hope to increase the number until we shall have intensive supervision of this work."

The information given in the replies is here summarized:

Outline

1. The Purpose of Penmanship Training
2. The Need of a Supervisor
3. The Course of Study
4. Motivation
5. Training of the Teachers
6. The Demonstration Lesson
7. Testing
8. Miscellaneous Suggestions
9. Fewer Movement Drills and More Application
10. Tracing
11. Pen and Ink
12. Departmental Teaching

In the discussion which follows frequent reference is made to the returns of the questionnaire.

From the *Research Bulletin* of the National Education Association for March, 1923, we learn that the following nineteen additional cities have supervisors of penmanship: Birmingham, Ala.; Oakland, Calif.; Denver, Colo.; Bridgeport, Conn.; Indianapolis, Ind.; Louisville, Ky.; Minneapolis, Minn.; Camden, N. J.; Paterson, N. J.; Yonkers, N.Y.; Cincinnati, Ohio; Cleveland, Ohio; Dayton, Ohio; Youngstown, Ohio; Portland, Me.; Pittsburgh, Pa.; Nashville, Tenn.; Dallas, Tex.; Fort Worth, Tex. We have thus accounted for fifty cities that employ one or more supervisors of handwriting.

Is the Technical Supervisor of Handwriting Necessary?
The writer was probably in error in advising superintendents who have no penmanship supervisors to consign his circular to the waste basket. The result is that all but a few of the replies are from cities that employ a supervisor. It would have been illuminating to learn the methods used in cities that depend entirely upon principals for supervision. That is the case in New York and is the specific problem of the author. But as questionnaires are among the burdens of the modern superintendent the writer did not care to issue a second circular to mend his error.

One superintendent, Mr. E. E. Lewis, of Rockford, Illinois, says bluntly that he doesn't believe in the supervision of penmanship by experts and that, in his judgment, it is a waste of time and money to overemphasize mechanical methods of teaching penmanship. At the other pole is Mr. R. E. Wiatt, of Los Angeles, who thinks that "a good live bunch of writing supervisors and assistants is the prime requisite." Between these extremes stands Superintendent Sheridan, of Lawrence, Mass., who says that he had a supervisor some years ago when he introduced the Palmer system, but for fourteen years he has had none.

This question is bound up with one's theory of supervision and teaching and the function of pen-

manship. The expert is undoubtedly needed somewhere. A course of study in writing ought to be made; and it cannot be made properly by a superintendent and his committees unless they can qualify as writing masters. We admit this freely in other special subjects like music, drawing, cooking, and manual training. Writing, though one of the Three R's, is really a manual art, and should be governed by principles of psychology and physiology, as well as by the experience of experts. Some of the larger cities find it impracticable to employ a staff of writing masters to teach in the classrooms. They therefore depend upon the class teacher to do the work. In this case the regular teacher should be required to qualify in the kind of writing she is expected to teach.

In New York this is accomplished in a number of different ways. Some years ago many schools voluntarily adopted, with official sanction, the Palmer system, and, as is well known, Mr. Palmer will not be responsible for the writing of any class unless the teacher thereof practices to the point of perfection the Palmer method. In this way thousands of our teachers became expert writers. Then the Department of Education opened normal penmanship classes in the evening high schools of the city, and teachers were encouraged to take these courses. A little later special teachers of penman-

ship were appointed in the training schools, so that all the graduates of these institutions are now expert writers. The result is that today probably fifty per cent of our teaching and supervising staff are fine penmen.

But mastery of the subject, though a large part of the necessary equipment of the teacher, is not quite the whole of it. Even if one hundred per cent of the teachers were good writers, supervision would still be necessary.

The writer has been reluctantly compelled to revise his opinion on this subject by the results of the experiment detailed in chapters VII, VIII, and IX of this treatise. After the first survey he was quite confident that principals and their assistants as now trained in New York were able to supervise writing as well as other common branches. Seven of the twenty-five schools had achieved the prescribed standard in every grade and all of them had reached the standard in some grades. He was optimistic enough to believe that in another year he could bring all of them up to grade. He has been cured of this optimism, for the second survey proved that, while some schools had improved enormously, others had actually lost ground!

An Experiment in the Supervision of Handwriting (58). The Detroit experiment in supervision, which had not been made known when my own experiment

began, throws considerable light on this question. The author of the report is supervisor of handwriting in the public schools of Detroit. In order to measure the effect of supervision, a preliminary survey of penmanship was made in all the schools of the city. During the term ending June, 1919, the schools were divided into four groups of twenty-three each. The point scores for rate and quality were tabulated and the quartiles computed. An equal number of schools whose results fell into the upper, middle, and lower quartiles was put into each group, so that the groups would be well balanced.

Group I was not visited by the supervisor at all.

Group II was visited twice by the supervisors. About fifteen minutes were given to each room. The teacher gave the lesson and the supervisor gave little help, his presence being the chief stimulus to improvement.

The rank of each school in Group III was made known, so that supervisors could give more help to schools that needed it most. Two visits were made to each school in this group.

The schools of Group IV were visited in the same manner as those of Group III, but further information was given. Not only the rank of each school was known, but also the rank of each room. Special attention was given to rooms ranking in the lowest quartiles.

The results were as follows:

- (1) Group I made a medium of 29.1 per cent of possible gain.
- (2) Group II made 35.8 per cent gain.
- (3) Group III made 40.1 per cent gain.
- (4) Group IV made 37.4 per cent gain.

The general conclusions are:

- (1) Supervision pays.
- (2) That supervision is most effective which gives special attention to those who need it most.

This is another instance of confirming common sense and common experience by scientific experiment. The ultimate result of the experiment was the permanent adoption of this method of supervision in the city of Detroit.

The Technical Supervisor Indispensable. This is proved to the writer's satisfaction by his own experiment as well as that of Detroit.

(1) *Teachers are incapable of making scientific surveys.* One thing is perfectly obvious as a result of these two surveys; namely, *that teachers without special training cannot successfully use our writing scale to measure their products.* Seventeen schools reported that they had used the scale. On many desks I found packages of writing drills that had been scored. In nearly every instance the class median was marked higher than the grade standard.

Yet the scientific survey shows that some of these same teachers are far below standard and that they are making no progress. Such scoring is worse than useless because it gives teachers a false sense of security. Ordinary judgment seems to be safer than inaccurate scoring. Mr. Nifenecker's assistant, Mr. Hentz, found it necessary to have ten sessions of several hours each before his seventy-nine scorers were able to do work that had scientific validity.

But after all, no one should be surprised at this discovery. The instruments of scientific measurement are highly technical, and require delicate adjustment and manipulation which only the expert can achieve. We need no demonstration of the fact that a game of skill like golf requires long practice under expert guidance to make a good score. To become really proficient requires years of practice. This is true also of skill in law and medicine and preaching and teaching. Many things can be taught by books and lectures and classroom instruction, but actual skill, whether of the surgeon, the lawyer, or the preacher, can come only by experience.

The tools of the intellect demand as much practice as those of the hand. All intelligence and achievement scales are such tools. An apprentice may use them, but his product will be as crude and imperfect as that of the beginner in golf, or carpentry, or painting. Only the master workman can

turn out a marketable product in industry. The same is true in the field of educational measurement. The reason why this matter is thus stressed here is because, for the first time, the writer has become thoroughly convinced of the facts in the case. It is a serious matter to exploit children by investigations when the investigators are so ill qualified for their task that the results are worthless. Here is a case where Josh Billings' saying applies: "It is better to know less than to know so much that ain't so."

Superintendent Ettinger was therefore merely protecting the children when he issued his recent order that all scientific measurement work is to be supervised and controlled hereafter by our department of Reference and Research. When our Board of Superintendents supplied the teachers with a handwriting scale, they took an important first step toward improvement in penmanship, but unless and until they provide training for teachers in the use of the scale, no useful purpose will be served by that instrument.

(2) *Inspirational supervision alone* is inadequate to solve our penmanship troubles. There are two types of schools and classes that render this kind of supervision futile, namely:

(a) Those who refuse to coöperate. They may or may not be able to produce satisfactory results,

In any case, they won't try. Such cases are rare in my experience. My people have been most loyal and helpful in their attitude. The conceited principal or teacher thinks he knows how to run his own school or class and needs no outsider to tell him how. He may be an excellent writer himself, and so he forgets that playing golf and teaching another to play are two totally different processes. He takes John Adams literally, who says that "all a teacher needs is a knowledge of his subject and a sense of humor!"

(b) Those who are willing but incapable. They are perfectly docile and try to follow your suggestions. But somehow they lack the power to get results. They need some one who will take the class and show exactly how the trick is done.

(3) *An attitude of complacency.* A third reason why we need a technical supervisor is that many teachers do not realize how poor their penmanship is. They are self-satisfied and imagine that the writing is good enough. In a recent article (59), Mr. J. B. Shouse says that the "attitude of complacency" is one of the obstacles to good handwriting. During his investigation he found many writers "who declined to admit the imputation" that the writing was poor. He says further that "in the matter of the quality of handwriting, carelessness is the normal attitude." This is because a

“person’s handwriting is nearly always legible to himself,” and “one is not always a reliable critic of one’s own performance,” and writers “are not sufficiently aware of the detailed defects of their own handwriting.” To the attitude of complacence may also be added a shadow of the green-eyed monster. If you doubt this bring an exhibit of superior penmanship to a conference of principals. Some will not deign even to glance at the specimens. A few will examine them with more or less care. None will ask for permission to take them home to be used as models for their own teachers.

(4) *The difficulty of breaking up old habits.* Mr. Shouse suggests a fourth explanation of the meager results in the improvement of handwriting. “To *modify* a habit requires attention, but the habit may be exercised without particular attention to the act”; and furthermore, the “modification of a habit in the direction of improvement is more difficult than the formation of a habit.” The purpose of all writing instruction, after a pupil knows the forms of the letters, is the improvement of handwriting habits. But the demand for a large amount of written work wherein writing is used as a tool tends to nullify the teacher’s efforts to obtain improvement. The formal writing drills are always better than the applied writing found in spelling, dictation, composition exercises, and notebooks.

Significance of the Principal's Attitude. St. Louis has one supervisor of penmanship and seven assistants. If New York were as well supplied with writing supervisors as St. Louis is, we should have a head supervisor with fifty-seven assistants! There would be two experts for each district superintendent and nine additional ones for special assignment.

In the St. Louis Survey a study was made of the relation of the principal's attitude toward penmanship and the achievements of his school in the subject. Principals were classed by the supervisors as "favorable," "passive," or "antagonistic." The outcome of the study is inconclusive. A group of schools whose principals were classed as passive or antagonistic to the supervisors had better penmanship than another group whose principals were said to be favorable. Perhaps it would be just to say that some supervisors were able to get results in spite of the principal.

But where there are no expert supervisors and the results in handwriting depend entirely upon the principal, his attitude is all important. If he is indifferent or incompetent, penmanship, like other subjects, will languish. The following quotation, whose authorship I have forgotten, emphasizes the fact that writing systems cannot teach themselves:

So long as there are principals and teachers who are unwilling to assume their obvious duty in connection with the teaching of

practical handwriting, there will continue to be new, untried systems of penmanship, which will be offered by their authors, publishers, and agents as panaceas for all the chirographic ills of the present and future generations. All of the new systems of penmanship, whether they contain a modicum of good, or are wholly bad, will find eager apostles, who are still seeking that intangible something in a penmanship system which will teach itself and relieve teachers from the responsibility of learning how to teach practical handwriting. This feverish anxiety to avoid personal responsibility in connection with the teaching of penmanship reminds us of an old and almost forgotten hymn, one verse of which runs about as follows:

As when a raging fever burns
We change from side to side by turns,
It is but poor relief we gain
To change the place and keep the pain.

The Course of Study. Only a few of the cities reporting mention a course of study in handwriting. Trenton has just adopted one. New York has a complete course of study and syllabus, as well as an official scale, standardized letter forms, and grade achievement norms. Eight of the cities use the Zaner system, which takes the place of a course of study, and six employ the Palmer system. Most of the other cities send out periodic instructions which teachers follow in lieu of a printed syllabus. One gets the impression that writing has been a sort of Cinderella among the sisterhood of studies, receiving scant and reluctant attention only when it threatened to bring scandal upon the family.

If this silence concerning a course of study in handwriting means that the average American community has no definite curriculum in penmanship, then we have one sufficient reason for the unsatisfactory results in school writing. In penmanship, as in other arts, there should be grading from the simple to the more complex forms and drills, with provision for systematic review and application. In New York we have not only a syllabus, but in the writer's district, we have a complete set of writing plans made by a committee of principals and teachers, covering the sixteen grades, each plan containing eighteen graded lessons, and each lesson-whole containing a week's work, which may be divided into three, four, or five lessons.

The weekly plan is a sort of project with a definite aim and graded steps leading to a concrete achievement. For instance, the first week of Grade 2A begins with a drill on capital *M*. This is followed by a drill on *ary*. The synthesis of the two gives us *Mary* for the next task. Then the two words *has* and *doll* receive attention, after which comes the final achievement, *Mary has a doll*. The sixth week of Grade 5A opens with one line of *push-pull* and one line of *ovals*. This is followed by alternate ovals and capital *T*'s; then a line of *T*'s; then alternate ovals and *F*'s; then *P*'s; two lines of *h*'s; two of oval and *ench*; oval and *C*, *Canada*; oval and

tled; and the final sentence repeated: *The French settled Canada*.

On the cover of each plan we give the syllabus requirement for the grade and the grade standards; e.g.:

5a
Penmanship Plan
18 Weeks
Syllabus

Muscular movement applied in Drill on straight line and ovals.
Review of capitals and small letters. Much sentence practice.
Drill on figures.

Grade Standards	
Form.....	47
Movement.....	48
Spacing.....	51
Speed.....	59
(New York Penmanship Scale)	

The district writing plans embody the writer's own theory of penmanship and were worked out under his direction by experienced teachers and supervisors of the subject. At the time the plans were made none of the committee were familiar with the innovations of Houston and Mills, nor had Professor Freeman yet published the following extract (*The Elementary School Journal*, September, 1923):

Modern progressive instruction in handwriting departs widely from the older type of instruction in the character of the drill

which is given. A large share of the time of the pupil used to be spent, and is still spent in many cases, on exercises which are preliminary to writing. Instead of actually writing, the pupil spends his time in a kind of setting-up exercise. It is as though a person in training to be a carpenter should spend his time in calisthenics. We are familiar with the ovals and push-and-pull exercises which sometimes occupy a large share of the writing period. . . . The greater part of the practice in handwriting should be spent on actual writing. There are at least two important reasons why practice should be, for the most part, on letters and words:

(a) If the practice is on letters, the pupil is learning to make the same kind of movement which he is required to make in all his writing. If the practice is on simplified forms, on the other hand, the pupil is almost sure to develop a kind of movement which he does not use in his ordinary writing. . . .

(b) The second reason why purely formal drill should be reduced to a minimum is that writing is primarily a means of communication or expression of thought. If the pupil spends an unusually large amount of time on purely mechanical exercises, the mechanics of the writing are likely to obtrude themselves too strongly on his mind, even when he is writing wholly for the purpose of communicating thought.

Motivation. The term *motivation* is not new. It is older than any of the modern theories of interest, but its present educational connotation has been acquired quite recently. Professor McMurry's use of it in the New York School Inquiry has had considerable influence in giving the term its present status in educational history.

The significance of motivation is best appreci-

ated by a brief historical consideration of interest. Such a review would show a progressive development of the idea. From Pestalozzi we learned that sense perception is the basis of elementary instruction, and hence "object lessons" came into vogue. We soon discovered, however, that object lessons might become very tedious to children, and presently this form of teaching was superseded by a new fashion. Then came Herbart with his interest and apperception, and later Dewey with his self-expression, and later still the schoolman of today with his *motivation* and the *project*.

The essence of all modern theories of interest is that it is the result of knowledge or activity. Some educators look upon interest as a means of securing attention, "hoping that the knowledge will remain after interest has departed"; but the Herbartians taught us that it is the business of education to incite an interest that will abide after the knowledge has passed away. Thus we speak when we refer to *subjects* like literature, science, geography, or history. But penmanship is not a subject; it is an art, a mere tool of education, without intrinsic thought. It does not fully function until it is automatic; that is, until it has been turned over to the nerve centers. There is therefore small chance of a permanent interest in penmanship as such.

What we mean by motivating penmanship, there-

fore, amounts generally to the employment of temporary devices to entice children to practice drills which are in themselves, like dishwashing, uninteresting. In other words, we employ indirect rather than direct interest. The following forms of this sort of motivation are reported by the various supervisors who answered my questionnaire:

1. *Competition*: Divide the class into two teams, and play one against the other, selected pupils acting as leaders. Or play school against school in the same district.

2. *Tests* by standard scales, the object being to attain the grade scale.

3. *Certificates* of merit issued by the supervisor or principal. Two cities employ this device extensively.

4. *Gummed stars* attached to meritorious papers.

5. *Buttons, badges*, etc.

6. *Honor Rolls* in classroom.

7. *Excuse* pupil from formal drills as soon as he has achieved his grade standard. But measure his writing frequently, and if he backslides, put him back on the treadmill!

8. *The joy of achievement*. This is direct interest and real motivation. It accompanies all successful effort. With the best kind of teacher it is all the incentive needed.

The most skilful writing teacher in my district employs no adventitious aids of any kind, and the children are always eager for the writing lesson. But such teachers of penmanship are so rare that it is idle to expect all to employ only the highest incentives. To secure adequate results from the

average teacher we must make concessions to human nature as we find it and permit her to use any devices that serve to keep children at their drill until they reach the stage of automatism.

To this list may be added exemption from special supervision of any school that has attained grade standards in every class. It is conceivable that a staff of supervisors might be so efficient that they would lose their jobs!

Training the Teachers. Ten cities report normal classes conducted by the supervisor. Four have general conferences from time to time where instruction and criticism are offered. Three supervisors, after spending a day in school, have a conference with the staff after dismissal for the discussion of the day's findings. Four supervisors give tests in every room and then furnish each teacher with graphs to show the attainment of the class as a whole and of individual pupils. Three cities have grade meetings. Four provide penmanship instruction in the training school for teachers and require all graduates to qualify in the subject. Many cities send outlines at stated intervals, giving definite instruction to teachers. Others have group conferences, arrange exhibits, or use motion pictures. In two cases all teachers must qualify according to a specific scale in order to secure and hold their positions. In one city a trained scorer is

provided in each school to show other teachers and the children how to use the scale.

1. *Who gives the lesson?* When a supervisor visits a teacher in the classroom, what form of supervision does he give? In ten of the cities he gives a demonstration lesson while the teacher observes what he does. In three cases the teacher gives the lesson and the supervisor observes. Some of the supervisors have so many teachers to visit that the demonstration lesson is impossible. These therefore examine the written products, observe the children and teachers at work, make comments, and depart. Others, who have more time, spend an entire writing period in the room and do all the work.

2. *Query:* Which is the better plan?

If we accept the old Lacedemonian's dictum that *the chief business of the teacher is to make himself useless*,¹ then the majority of supervisors reporting are wrong. They do too much for the teachers. A class in physical training is not going to get much physical development by watching the teacher go through the exercises. Neither is there much nourishment in seeing other people eat. It seems to the writer that those supervisors have the soundest pedagogy who let the teacher do the work, for skill in any art comes by practice, practice, practice. Occasionally a demonstration lesson is very useful

¹ The theory and practice of the Dalton Plan of education are a literal application of this principle.

even as a concert by Paderewski is of inestimable value to the student of the piano. But observation is but a supplement of practice, not a substitute for it.

Special teachers of drawing, music, and physical training in New York plan the work for the teachers, interpret the syllabus, visit the classes, observe the teachers at work, evaluate the results of instruction, but give the lesson only occasionally for beginners and unsuccessful teachers. Writing supervisors, if we had any, would doubtless follow a similar procedure. In this way the teacher gets development as well as the children. Spoon feeding is necessary for infants, but is not desirable for adults unless they are sick.

Movement Drills. Two supervisors, as we have already seen (p. 32), in cities remote from each other, have come independently to the conclusion that time is wasted by the customary oval and straight-line movement drills. Mr. Harry Houston, of New Haven, has developed a system of writing which employs none of these drills. Arm movement is secured by writing letters an inch or more in height, and then gradually grading the writing down to the normal size. Of the usual movement drills Mr. Houston has this to say:

This method was started in business colleges or in special penmanship schools. The students were adults who were pur-

suings but two or three subjects. Much time was given to practice. These methods have been handed down and put into the grades where the conditions are radically different. The students are children instead of adults. The curriculum has increased to such an extent that only a comparatively small amount of time is possible for penmanship instruction.

In like vein writes Mr. E. C. Mills, of Rochester:

I have completely eliminated the oval and push-and-pull practice in the teaching of handwriting and develop all movement in letter formation.

When Mr. Houston called upon the writer in New York, he had with him an exhibit of handwriting done under the conditions described above. It was very legible and beautiful writing. He claims that in modern life, with the prevalent use of the typewriter, speed in writing is far less significant than legibility. In the author's survey of his district it was found that the standard for speed was exceeded in every grade but the highest three, while in form all the grades but two were on an average below standard. This indicates that the schools of the district taken together attain speed at the expense of form. What we need is more attention to legibility. No effort has been made to develop speed. It is apparently the natural result of the great amount of applied writing children have to do in the schools of today.

These two supervisors may, of course, be simply

illustrations of the law that under a good teacher children learn in spite of his method. It is easy to show that the A-B-C method of teaching reading is contrary to every known law of learning. Yet the writer managed somehow to learn to read by that method, or in spite of it, and so did millions more of his and preceding generations.

Some of the objections to the excessive movement drills, as voiced by teachers and parents, may be summarized thus:

1. The writing has no individuality, all the children write alike.
2. Time is wasted.
3. Children taught in this way produce writing as illegible as that of copy-book writers of a generation ago.
4. Teachers break down from overstrain.
5. Half the teachers are opposed to the system.
6. Mr. C. E. Doner, director of penmanship in the three State Normal Schools of Bridgewater, Framingham, and Salem, Mass., says:¹

I think that some advocates of muscular movement systems have shot over the heads of the children, especially in the lower grades. They have introduced business college methods of teaching penmanship into the graded schools, without taking into account a well-graded course of study and practice which safeguards the interests of the child, rather sacrificing the child to make a success of some method of writing.

¹ From *Boston Traveler*, Dec. 19, 1922.

The "grind" on movement drills which the children have to go through doesn't warrant the expenditure of time put upon them to learn to write. Much valuable school time is wasted in the practice of meaningless drills which have no direct interest to children. Why not devote the time to actual writing, thus aiding the children to express themselves in plain characters in their own language?

It is the writer's opinion, based on twenty-five years of experience in supervision, that there is waste of time in abstract drills that lead to no immediate and definite goal. The writing plans of our district minimize mere movement drills and emphasize application to a concrete achievement in every lesson-whole. In Mr. Freeman's new book (25) there are no oval and push-pull exercises.

State Manuals. A number of states have issued manuals on handwriting, of which those of New Jersey, Massachusetts, and Ohio are examples.

1. *The New Jersey Manual* (36). This pamphlet gives practical directions to teachers on methods of teaching penmanship. The following topics, among others, are treated:

- (1) Position and penholding are emphasized.
- (2) Movement, ease, and speed are insisted on.
- (3) The treatment of left-handed pupils receives attention. Teachers are advised not to require children to change if the left-handed writing is good; nor to change when the child is twelve years of age, or more.
- (4) A copy book or copy slip is recommended unless the teacher is an expert writer.

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(5) Blackboard work is declared to be essential.

(6) Beginners should practice on the blackboard.

(7) The time schedule should provide a daily writing period of ten or fifteen minutes and a weekly total of seventy-five minutes.

(8) Blackboard crayons or wax pencils or large soft black pencils are recommended for the first year, pen and ink after that.

(9) Only the best materials are good enough.

(10) Ruling should be for base line only in all grades.

(11) Distance between lines should be as follows: First year, 1 inch; second year, $\frac{5}{8}$ of an inch; third year, $\frac{1}{2}$ inch; after that, $\frac{3}{8}$ of an inch.

(12) In the seventh and eighth grades children need practice on unruled paper since much of the social stationery is without lines.

(13) It is important to pass and collect material without waste of time.

(14) The teacher should write in the presence of children so that they may observe the process.

(15) The incentives recommended are:

(a) Personal interest and enthusiasm of the teacher.

(b) Preserving and exhibiting written work.

(c) Exchanging specimens between classrooms.

(d) Committees of pupils to decide what children have the best position and writing.

(16) The writing of exercises in other subjects is the real test of success in penmanship.

2. *The Massachusetts Manual* (44). The time recommended in this book is 75 minutes a week for the first two years; 100 minutes for the next four years. Certain principles of teaching are emphasized, as follows:

(1) The teacher has not taught until the pupil has learned.

(2) The writing teacher must know as much about writing as she does about other subjects in the curriculum, and she must devote as much time and skill to the planning of writing exercises as she does to the planning of other lessons.

(3) In all instruction involving skill or dexterity, imitation is the best means of training. Hence, the teacher must be a good model.

(4) In penmanship the teacher must emphasize the *process* rather than the *product*. Legibility, rapidity, ease are the essentials. In teaching, maintain this order.

(5) The teaching of handwriting is successful only when the pupil carries over into application what he learns in formal lessons.

3. *The Ohio Manual* (56). The function of writing as defined by this manual is "to express, convey, and record language in an intelligible and practical manner." The essentials set down are these:

(1) The writing skill of the teacher in blackboard writing, which requires only one third as much practice as good writing on paper.

(2) For three months all the writing of the beginners in the first grade should be done on the blackboard, because such writing is larger, freer, and less exacting than writing on paper.

(3) Position is absolutely necessary to correct movement. The body should be straight, the paper slant, and the hand should slide on the third and fourth fingers.

(4) Movement and form should go hand in hand from the beginning. Each lesson should be introduced by movement drills.

(5) Form or legibility, uniformity of size, slant, and spacing—these must be insisted on first.

(6) Counting for speed exercises is recommended, as follows:

First grade, 100 ovals per minute

Second grade, 125 ovals and from 5 to 10 words per minute

Third grade, 150 ovals per minute

Fourth grade, 175 ovals and from 10 to 12 words per minute

Fifth and sixth grades, 200 ovals and from 12 to 15 words per minute

Seventh and eighth grades, 200 ovals and from 15 to 20 words per minute

The average speed of six standards reported by Freeman for the eighth grade is 79 letters per minute. If we assume that the average number of letters in words is four, 20 words is the equivalent of 80 letters.

There are doubtless many more such manuals in existence, some better, some worse. They are evidence that the need of better handwriting is widely recognized and that an attempt has been made to improve it by state-wide regulation. All such efforts are useful, at least potentially; but the key

to the educational situation is where the teacher and the pupil meet. To the child there is no course of study except the teacher. The curriculum can reach the pupil only as it sifts through her. Therefore the real supervision is done in the classroom by the principal.

CHAPTER VII

THE SUPERVISION OF HANDWRITING

(*Continued*)

The Measurement of Handwriting. The use of standardized scales for the measurement of handwriting is, according to my returns, common practice. Four scales were sent to me, and these do not include either the Ayres or Thorndike measures. One supervisor measures every pupil's work twice a year. A second does it three times a year. Another applies a monthly test, and still another has a scale posted in every room and the pupils are taught to measure their own product. In some cities the teachers do the measuring, in others the principal does it. By common consent, accurate measurement is essential to determine progress, to give the children and teachers a definite, attainable goal, and to supply criteria for intelligent and effective supervision.

1. *Unreliability of teachers' marks.* Many investigations have shown the unreliability of teachers' marks, even in mathematics and spelling, subjects in which, one might suppose, there exists small chance for variability. In penmanship, it has been proved, not only is there great divergence of

opinion among different teachers concerning a given specimen, but a single teacher marking the same specimen at different times will assign different values to it.

These statements may be verified by a teacher in the following ways (48):

- (1) Take a set of papers and mark them by percentage or letters, putting the mark on a separate score sheet but not on the pupils' papers.

- (2) Lay the papers aside for a few days.

- (3) Score the papers a second time without referring to the first marks. Record the second scores on a second score sheet.

- (4) After three or four days score the papers in like manner a third time.

- (5) Compare the three sets of marks. They will vary widely in many cases.

A second test suggested is this:

- (1) Mark the papers of your class.

- (2) Have another teacher mark the same papers without referring to your marks.

- (3) Have the papers marked by a third teacher independently.

- (4) Compare the marks given by the three scorers. The scores of the different teachers will differ more or less widely for the same specimen of writing.

These experiments will make it plain why, on the

basis of a teacher's judgment, it is impossible to compare one class with another, or one school with another, or one school system with another. To make such a comparison with any degree of fairness it is necessary to devise some method of measuring penmanship which shall be impersonal and make some approach to scientific accuracy. To measure with exactitude we must have a defined unit, so that the result will be substantially the same no matter who does the measuring. A scientific procedure must be so minutely and clearly set forth that any competent person in any part of the world can repeat it and verify or disprove the conclusions arrived at.

2. *The pioneer.* To Professor Edward L. Thorndike (67) belongs the credit of having formulated the principles underlying the construction of a writing scale, and of having actually constructed the first scale in accordance with those principles. The date of this achievement reminds us of the recency of the measurement movement in education. In the brief span of years since 1910 scores of scales of all sorts have been devised, and now the poor teacher is in danger of being flabbergasted by the formidable array of technical instruments that are thrust into his hands.

Dr. Thorndike laid down the rule that a writing scale for grades 5 to 8, inclusive, should include

about ten qualities differing each from the next by equal steps (that is, within four per cent of a step or one-half per cent of the difference between the best and the worst). One would need several thousand of each kind of sample, each rated by two hundred judges. This means roughly four thousand hours of labor. Hence, his scale is confessedly imperfect, as it did not meet the ideal conditions of scientific accuracy. It is only a preliminary scale, and it measures "general merit" only; namely, legibility and regularity.

3. *The Ayres Scale* (2). Dr. Ayres constructed a scale with eight degrees of quality for grades 2 to 8, inclusive. The numerical values assigned to these degrees of merit are 20, 30, 40, etc., up to 90. Each step of the scale is represented by three specimens; namely, vertical, semi-slant, and full slant. A later scale, also a three-slant edition, was devised to measure the handwriting of adults. A still later scale (1917) called the "Gettysburg Edition," has only one specimen for each step, and each specimen has the same copy. It furnishes standards for speed and quality for all the grades above the fourth.

4. *Johnson and Stone Scale* (34). This scale is similar to those of Ayres and Thorndike, but is more analytic. Each specimen of the scale is accompanied by an explanation of its defects, which in-

clude letter formation, uniformity of slant, alignment, spacing, quality of line, size, and degree of slant.

5. *Breed and Downs Scale* (6). This scale was made for local use in Highland Park, Michigan, by scoring specimens with the Thorndike Scale, and then selecting specimens for a five-step scale for each grade from 3A to 6A, inclusive. A standard for speed is given for each grade.

6. *The Freeman Scale* (20). This scale is different from all the preceding scales in that it is really five scales in one. It measures uniformity of slant, uniformity of alignment, quality of line, letter formation, and spacing.

7. *The New York Scale* (46). This scale is the work of Mr. Clyde C. Lister and Dr. Garry C. Myers, instructors in the Maxwell Training School, Brooklyn, New York. Like the Freeman scale, it is analytic. It measures form, movement, and spacing. Under *form* are considered letter formation, uniformity of size, and correct slant. *Movement* includes quality of line, whether heavy, tremulous, or broken. Under *spacing* the writing is judged as to uniformity of space between letters, between parts of letters, and between words.

The standards were obtained by examining over twelve thousand specimens, from grades 4B to 8B, written by children of New York public schools.

The grade standards of the New York Penmanship Scale are as follows:

GRADE STANDARDS

Grade	Form	Movement	Spacing	Speed (Letters per Minute)
4B	43	46	48	56
5A	47	48	51	59
5B	51	50	54	63
6A	54	53	57	67
6B	57	56	60	71
7A	59	59	63	75
7B	61	62	65	80
8A	63	65	67	85
8B	65	67	69	90

8. *Gray's Score Card*.¹ One of the most useful devices for diagnostic measurement of handwriting is Gray's Score Card, which is herewith presented. Some of the scales measure general quality only, but do not reveal the particular defects which render the writing unsatisfactory. It is a sound principle of teaching that a child should surmount one difficulty at a time. And when he is told that his writing is poor, he is entitled to know just in what respects he has failed. Also the teacher, in prescribing remedies, must know in detail what factors of the complex writing process need stressing. The

¹ Devised by C. Truman Gray.

Gray card gives all this necessary information. It also weighs the various items according to their relative importance. Thus, the formation of letters receives twenty-six credits out of a hundred.

Thus spacing of letters is worth 18 points, neatness 13, spacing of words 11, spacing of lines 9, alignment 8, size 7, slant 5, and heaviness of line 3.

Mr. Horace G. Healey (30), in an address on "Penmanship in the High Schools," expresses the opinion that penmanship is a proper and necessary high school subject, for the reason that the elementary school pupil is too immature mentally and physiologically to establish life habits, and for the additional reason that there is not time enough in the grades to do the job well.¹

The high school writing teacher, he thinks, should do more individual work than the elementary teacher. He should find out each pupil's needs and then prescribe the proper exercises to meet those needs. The Gray Score Card is the instrument needed for this procedure.

9. *Classification of scales according to use.* It is evident from the brief descriptions given of the several scales that they fall into two general classes. The Thorndike, Ayres, Johnson-Stone, and Breed-Downs scales are used to measure the quality of writing in general. These are useful for making

GRAY'S SCORE CARD

	Perfect Score
1. Heaviness.....	3
2. Slant.....	5
Uniformity	
Mixed	
3. Size.....	7
Uniformity	
Too large	
Too small	
4. Alignment.....	8
5. Spacing of lines.....	9
Uniformity	
Too close	
Too far apart	
6. Spacing of words.....	11
Uniformity	
Too close	
Too far apart	
7. Spacing of letters.....	18
Uniformity	
Too close	
Too far apart	
8. Neatness.....	13
Blotches	
Carelessness	
9. Formation of letters.....	26
General form.....	8
Smoothness.....	6
Letters not closed.....	5
Parts omitted.....	5
Parts added.....	2

surveys of school systems for the purposes of determining the gross merit of handwriting. The Freeman Scale and the New York Scale and the Gray Score Card are necessary when detailed information is wanted to assist the teacher in adapting his instruction to the needs of individuals.

10. *Relative value of scales.* It is not easy to say which of these scales is most reliable. As we have pointed out, different scales are useful for different things. If you wish to analyze in detail the merit of a pupil's handwriting, you will use Freeman's Scale, or Gray's Score Card, or both, or the New York Scale. If you desire merely a measure of the general or total achievement in handwriting, you employ a scale like that of Ayres or Thorndike. Several studies have been made to determine which of the scales is more reliable. Dr. R. Pintner (53) thinks Thorndike's is better than that of Ayres, while Starch finds them of equal merit, and Freeman believes Ayres to be superior to Thorndike. When doctors disagree how is a layman to decide? Perhaps this statement is the real answer: Each is best for its own purpose.

11. *What is a reasonable standard?* The grade standards of the various scales are the median performances of present-day school children in certain communities. Are these proper standards? The

New York Scale is based upon achievements of New York children. As penmanship on the average is not of a very high grade, it is fair to ask whether this standard is not too low. In my district survey I found a 4B class that had attained an 8B standard in form. This shows how much better our writing might be if we had expert teachers. As the general level of penmanship teaching improves, the median performance will rise; hence it would seem that the grade standards ought from time to time to be revised in accordance with these changes.

Different scales unfortunately have different units of measurement and different numerical values to represent the grade of attainment. It is therefore not easy to reduce the several scales to a common denominator for purposes of comparison. Such a reduction, however, has been made by Monroe (45) and others, and is given here:

COMPARISON OF SCALES (Quality)
School Grades

	2	3	4	5	6	7	8
Ayres	44	47	50	55	59	64	70
Freeman	17.9	18.4	19	20	20.8	22	23
Thorndike	9.36	9.75	10.13	10.76	11.34	11.89	12.66

In the following table certain median scores are compared with the Freeman Standards:

MEDIAN SCORES (SPEED)
School Grades

	2	3	4	5	6	7	8
Cleveland	.....	.....	.....	60	70	76	80
Iowa Schools	39.2	49.2	61.9	65.5	72.6	75	76.5
Kansas	32	35	51	61	67	71	73
Fifty-six Cities	30.6	43.8	51.2	59.1	62.8	67.9	73
Freeman's Stand- ards	36	48	56	65	72	80	90

In the following table certain median scores in quality are compared with Freeman's Standards (on the Ayres Scale):

MEDIAN SCORES (QUALITY)
School Grades

	2	3	4	5	6	7	8
Cleveland	.....	.....	.....	45	48	50	55
Iowa	35.7	39.8	44.5	49.1	52.3	57	61
Kansas	44	47	50	55	59	64	70
Fifty-six Cities	39.7	42	45.8	50.5	54.5	58.9	62.8
Freeman's Stand- ards	44	47	50	55	59	64	70

12. *The final standard.* The question has been raised whether it would be possible to achieve the present eighth-year standard two years earlier, so that the formal writing lessons might cease at the end of the sixth year. In fact, one superintendent made the statement some years ago to the writer that children should not be obliged to practice handwriting after the fifth year. This was at a time when penmanship in New York was probably the worst in the world! It was before any of the experimental studies of handwriting with which we are now familiar had been made. It was therefore mere opinion, based on neither experiment nor classroom experience.

Nutt's researches indicate that arm movement should not be stressed before the age of nine or ten (Prop. 16, p. 62). If penmanship lessons were to cease at the end of the sixth year, the pupil would have only two years in which to acquire the desired movement. It is self-evident that he could not form a life habit in so brief a time. The settled stage of handwriting does not occur before the high school period, and perhaps not even then. The mind and the muscles of a twelve-year-old child are immature and plastic. It is more than probable that if writing lessons were discontinued after grade six, even a good writer would lapse into bad habits and become a scribbler, while the poor writers

would certainly go to high school with an illegible scrawl. When teachers of penmanship become a hundred per cent efficient, it will be time enough to try the experiment of eliminating the subject after the sixth year. In the meantime we are not, on the average, completing the job in eight years, as one may readily prove by taking handwriting specimens of the pupils who enter high school.

CHAPTER VIII

AN EXPERIMENT IN SUPERVISION

In the spring of 1922 the author invited the Bureau of Reference, Research, and Statistics, of which Mr. Eugene A. Nifenecker is the Director, to conduct a survey of the penmanship of pupils in school districts 1 and 7. Inasmuch as the bureau had at its command no adequate force for the testing involved, it was decided to make the survey a coöperative project. The bureau directed the conduct of the tests, trained the teachers volunteering to act as scorers, and tabulated the results. The principals, through selected teachers, conducted the tests, and the scoring of the papers was done by the teachers volunteering to act in that capacity.

The report which follows describes the procedure adopted and presents briefly the results obtained.

1. *Scope of tests.* Samples of handwriting were obtained from all of the pupils of grades 4B to 8B, inclusive, in the twenty-five schools of the two districts. Table 1 shows by grades the number of pupils and classes involved in the test.

The samples were scored for Rate of Writing and for Form. The other elements of quality, such as Movement and Spacing, were not considered.'

TABLE 1

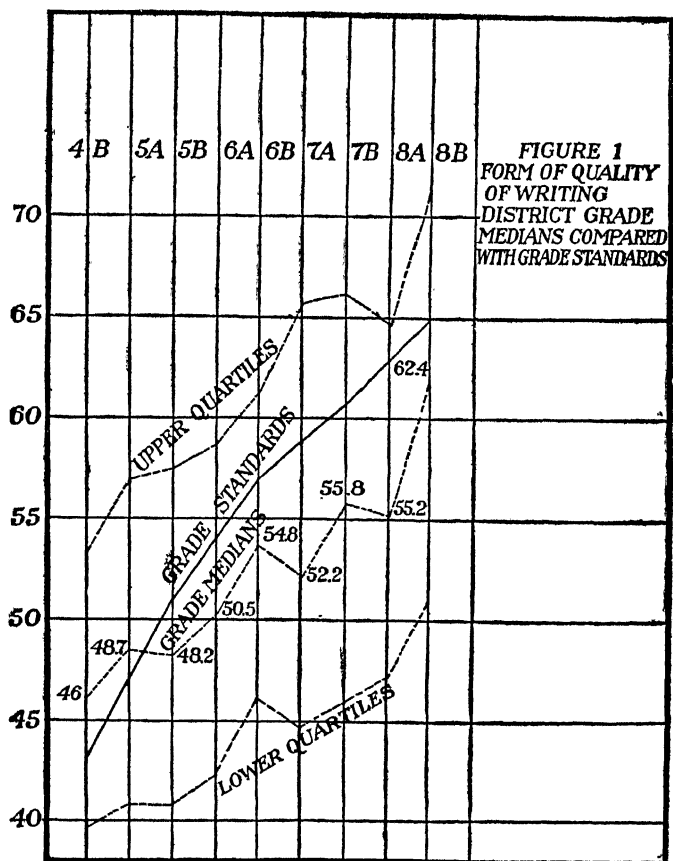
Number of Pupils and Classes by Grades Involved in Penmanship Survey (25 Schools)

Grades	4A	4B	5A	5B	6A	6B	7A	7B	8A	8B	9A	Totals
No. of Classes	1	52	54	52	53	47	45	41	35	35	1	416
No. of Pupils	19	1,909	1,978	1,912	1,945	1,699	1,633	1,425	1,219	1,193	33	14,965

2. *Character of tests.* The test consisted in having the pupils write repeatedly for two minutes the following sentence: "One must exercise in work and in play." The sentence had been learned before the day of the test and attention had been given to the word *exercise*, the only word in the sentence that might have offered spelling difficulty to some of the pupils.

3. *General district results.* The general results obtained for the districts as a whole are presented in Figure 1, which shows by grades the distribution of scores in Form for the 15,000 pupils tested. Figure 2 gives similar data for Rate of Writing.

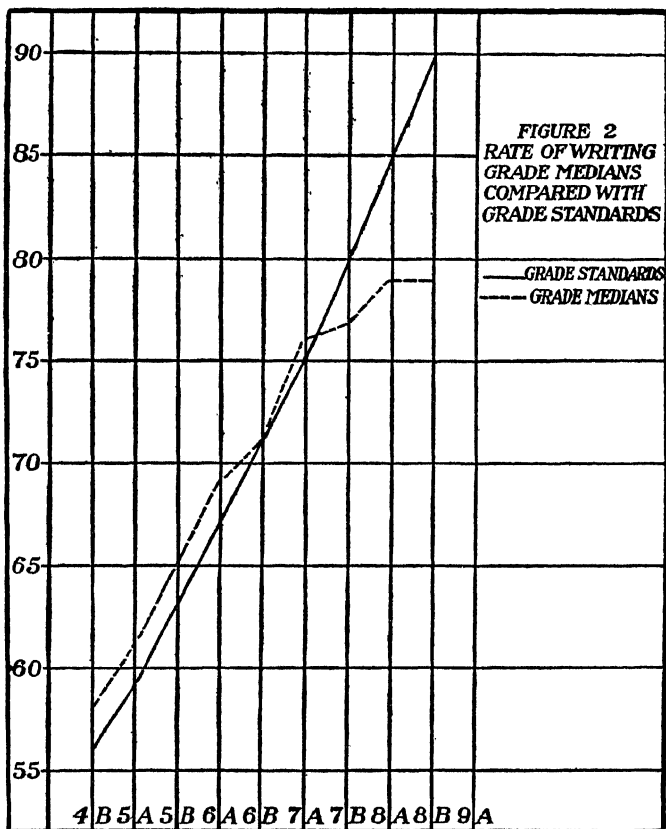
(1) *Results in form.* The quality of writing, it appears, increases more or less regularly. From Figure 1 we may note the development upward through the grades. The curve rises upward from 4B to 5A, drops slightly in 5B, rises in grades 6A and 6B, drops in 7A, rises again in 7B, drops slightly in 8A, and reaches 62.4 in grade 8B. The amount of improvement from grades 4B to 8B is slight, from



46 to 62, or 16 points, less than two steps on the scale.

The standards for Form recently adopted by the Board of Superintendents in the new syllabus in penmanship are shown by the solid line in Figure 1. Comparison of the general district medians with such grade norms shows that with the exception of grades 4B and 5A all grades are somewhat below the standard. The difference is greatest in the 8A and least in the 5B.

A prominent characteristic of the grade distribution is the wide range of scores in each grade. Pupils of all levels of ability are found in almost every grade. The variability in achievement results in marked overlapping of grades. The first quartile or 25 percentile is that point in the distribution below which fall 25% of the cases, while the third quartile or 75 percentile is that point on the distribution above which are 25% of the cases and below which are 75% of the scores. Between the first and third quartile lie 50% of the cases. If we find the difference between the two quartiles and divide by two we obtain what is statistically known as the semi-interquartile range, or *Q*. This is used as a measure of the variability of a distribution. From the table it appears that *Q* in each grade is from 7 to 10 points, a range that exceeds considerably the difference between grade medians.



In most grades the range of the middle 50% is greater than the difference between the median of the 4B and the median of the 8B.

(2) *Rate of writing.* Figure 2 presents a distribution of the pupils of each grade according to the rate of writing in terms of number of letters per minute.

From the figure it appears that the rate of writing increases quite regularly from 4B to 7A. The 7B and 8A show but slight increase and the 8B is the same as that of the 8A grade. In all grades but the highest three the grade median is slightly above the grade standard. In the 7B it is three letters below, in the 8A, six letters, and in the 8B, eleven letters below the norm.

The detailed distributions show almost as great a variability of achievement within the same grade as was noted in Form, and the overlapping of grades is as characteristic.

4. *Summary of conclusions:*

(1) When the results from all schools are combined it appears that the quality of the pupils' handwriting in all grades, with the exception of the 4B and 5A, is below standard.

(2) From grades 4B and 5A, which are standard in form, there is a slight improvement through the grades to 8B. The total increase in form from 4B to 8B is less than two steps on the scale.

(3) When the results for all the schools are combined it appears that the rate of pupils' writing in all grades is above standard except in grades 7B, 8A, and 8B. The rate in 8B is considerably below the grade standard.

(4) When the results by schools are considered it is seen that there are wide differences in the attainments of pupils in the same grades in different schools. All levels of ability are represented in each grade. In one school the 4B pupils write with 8B ability and in another school the 8B grade fails to equal the 4B standard.

(5) Out of 413 classes in grades 4B to 8B,

56 classes show standard attainment in form.

59 classes are 1 grade below standard.

56 classes are 2 grades below standard.

35 classes are 3 grades below standard.

32 classes are 4 grades below standard.

24 classes are 5 grades below standard.

17 classes are 6 grades below standard.

16 classes are 7 grades and more below standard.

46 classes are 1 grade above standard.

26 classes are 2 grades above standard.

24 classes are 3 grades above standard.

11 classes are 4 grades above standard.

6 classes are 5 grades above standard.

5 classes are 6 or more grades above standard.

(6) In rate—

83 classes show standard rates.

73 classes are 1 grade below standard.

53 classes are 2 grades below standard.

26 classes are 3 grades below standard.

18 classes are 4 grades below standard.

7 classes are 5 grades below standard.

18 classes are 6 or more grades below standard.

50 classes are 1 grade above standard.

32 classes are 2 grades above standard.

24 classes are 3 grades above standard.

14 classes are 4 grades above standard.

9 classes are 5 grades above standard.

4 classes are 6 or more grades above standard.

(7) The progress in most of the schools from grade to grade is more or less irregular, in some quite erratic, showing a varying emphasis and attention upon speed and form.

(8) The variability in the results of the same grades in different schools and of classes in the same grade within the same school indicates a lack of control over the product of instruction, such as comes from the use of grade standards.

(9) It appears from information given by the teachers who acted as scorers that, while most of the teachers knew of the existence of the New York Penmanship Scale, and while many had in their classroom copies of the scale, only a small proportion indicated that they used the scale regularly for

measurement purposes. Although some of the teachers had received for practice purposes the standardized material prepared and distributed by our bureau, many teachers had not received such material and had not been aware of its availability.

(10) An effort should be made in each school to control the product of the penmanship instruction by substituting the grade standards as set up in the syllabus for the varying standards of the individual teacher. Such grade standards should be regarded as goals for each grade and an effort should be made to bring up to standard those pupils who are now below.

5. *Object of the tests.* The writer had been for twenty years trying to improve the handwriting of children without satisfactory results. The methods he had employed were the annual examination, evaluation, and criticism of the penmanship in each classroom of his district (about one thousand) by ordinary observation and judgment. This method is necessarily faulty, as it is impossible for a supervisor to carry in his head appropriate standards for sixteen school grades. He cannot, with any confidence, assert by such a procedure that the writing in a certain grade or school is or is not satisfactory. All he can say positively is that the writing *seems* poor or good or *seems* to be better or worse than that of other schools or classes. If a principal or

teacher disputes the assertion, there is no way to silence the objector except by the arbitrary authority of the supervisor, and that is not a satisfactory substitute for facts.

When the Board of Superintendents adopted uniform letter forms and gave us the New York Penmanship Scale with grade standards, we had at our command the instrument for finding out what is the matter with our penmanship. The first step in our attempt to improve the writing of children is manifestly a survey. When you send for a physician the first thing he does is to make a diagnosis of your case. He employs instruments of exact measurement. He measures, to a tenth of a degree, your temperature. He counts your pulse beats. The stethoscope carries to his ear the sounds made by the organs of the chest. He may count the red corpuscles of your blood, or make a chemical analysis of your secretions. He must know what is the matter with you before he undertakes to cure you. We employed the methods of the physician and found out exactly *Who is Who* and *What is What*.

When the returns came in, we understood what John Bunyan means in the following quotation, which is a condensed passage from his *Heavenly Footman*:

There is no man that goeth to heaven but he must go by

the cross . . . Thou mayest know the cross by these six things:

(1) The doctrine of justification: A man is forced to suffer the destruction of his own righteousness;

(2) The doctrine of mortification: Is it nothing for a man to lay hands on his vile opinions?

(3) The doctrine of perseverance: Which is not only to begin but for to hold out;

(4) In self-denial: We that are strong ought to bear the infirmities of the weak;

(5) In patience: Some men, when they come to the cross can go no farther, but back again to their sins they must go;

(6) Communion with poor saints: To give is a seldom work, especially to give to the poor.

We now knew that in many instances our righteousness was as filthy rags. We had supposed that our writing was "good enough" or as "good as in other schools." But here were the hideous facts! While some classes were from one to eight grades above the standard a still greater number were from one to nine grades below standard. This was indeed a laying of hands on our vile opinions. But announcement was made that a year hence a second survey would be made, and all who were below standard were exhorted to begin the work of improvement forthwith and to persevere until they should win the prize. Supervisors were asked to practice self-denial and patience, to give up their

ease in Zion, and to minister continually to the poor saints!

6. *Remedial measures.* The writer sent the results of the survey to the several schools and announced the program for the improvement of handwriting. Following is an outline of this program:

(1) *Objective standard.* The value of an objective standard is eloquently set forth by these results. It is evident that I have been much too generous in estimating the merit of writing in a number of schools. I have called it satisfactory where it is very far from satisfactory. There is one school in which only two grades rise above the level of the 4B standard. The tendency of a supervisor, in estimating writing, drawing, and composition, is to take the general level of the school as the standard and then rate individual performances by that scale.

Now that we have an objective measure, we must face the facts and proceed to work up to the standard where we fall short of it. The only way to do that is to substitute the grade standards set up in the Syllabus for the varying students of individual teachers and supervisors.

Fortunately this is now possible. There are in each school one or more trained scorers who assisted Mr. Nifenecker. I suggest that conferences be arranged and that these expert scorers train the

rest of the teachers in scoring as they themselves were trained. Then every teacher in the school should score the writing of her pupils at least once a month. And the supervisors should take the scores at the beginning and the end of the term to determine the progress of the class and the success of the teaching. I advise that efforts be concentrated upon the grades that are below standard. I intend later in the year, if possible, to make another survey of the schools and grades that are below standard to find out whether any improvement has been made. There are eight schools that have no grades below standard. These will continue in their accustomed way. Several others have only a few low spots to level up. But about half the schools will have to start a very earnest campaign to improve their writing.

(2) *A definite and attainable goal:*

(a) One of the first considerations in any project is the setting up of a definite and attainable goal. In the present situation of penmanship we have such a goal. Now let us gird up our loins and "go to it"!

(b) So far as I can see, teachers in all the schools have about the same average writing ability and teaching ability. We are thus driven to the conclusion that the *vast differences* in results of penmanship and other studies are due chiefly to differences in supervision.

(c) In many classes the drills are fairly well done but the excellence does not carry over into the other written work, which is scribbled. This is one point of attack by supervisors.

(d) About one teacher in twenty will say before a spelling test: "Writing position." As position is a fundamental in good writing, here is another point of attack.

(e) In numerous classes the children do not fill up the spaces in their drill papers, thus missing the swing which secures the proper movement habit. Another point of attack.

(f) In the schools that have made good in penmanship, the supervisors carefully point out the errors of individual children and commend successful children by name. Stamping one's signature on a package of drill papers will not get results.

(g) The sum of little things makes big things. Excellence as a whole is never attained without excellence in detail. We are not teaching masses, but individuals, even when we are engaged in mass teaching. Just as concert work fails to secure efficiency of individuals in reciting poetry, so one cannot successfully teach writing by sitting at a desk. Each child is a problem that requires individual solution.

(h) Have you tried the monitorial plan? A child very proficient in penmanship shows a poor writer

how to do it. Have you had a conference on penmanship devices? Come, brethren, let us reason together. Some have done this thing. Let the rest of us determine that we can do it too. I am convinced that all can reach the standard because many of the schools that are not quite successful in writing do beautiful work in other subjects.

(3) *Devices*. Several months later every school was asked to report methods and devices employed for the improvement of handwriting. These were summarized and circulated in the district. Here is a partial list of them. The figures at the end of a paragraph indicate the number of schools reporting that device.

1. Insist on correct posture and movement in all writing (5).
2. Use the blackboard to teach the letter forms (2).
3. The children write frequently on the board to develop swing (1).
4. The pupil carries something (a penny) on the back of his hand to prevent excessive pronation (3).
5. The teacher corrects each writing drill daily in red ink (2).
6. Never give writing for punishment (1).
7. The use of a handwriting scale for comparison and measurement (17).
8. Personal commendation of teachers and pupils who do well (4).
9. Game and story of five pigs for sliding on nails (1).
10. Counting for rhythm (6).
11. Repeating jingle for drills (4).
12. Mr. Bartow, of the Palmer Company, helps (3).

13. Place a cylindrical pencil under the forearm. When the movement is correct, pencil keeps rolling (1).

14. Sliding the paper to the left for slant and position (2).

15. Sliding paper upward as in typewriter for the position (1).

16. Don't get ink into the pen's eye (not too much ink) (1).

17. Writing in the air (1).

18. Tracing for poor writers (1).

19. The teacher guides the hand of poor writer (1).

20. Name card kept on desk at all times (2).

21. Descriptive words used as cues (1).

22. Papers starred for excellence (1).

23. Class errors corrected on board (2).

24. Stress one thing each week (1).

25. The teacher places red check on paper for correct posture and movement (2).

26. Draw lines through one line of writing to test uniformity of slant (1).

27. Group writers according to proficiency (1).

28. Allow poor writers to pass around the room to select the best papers (1).

29. Have a poor writer sit next to a good one (1).

30. Honor Roll (4).

31. Pupils compare first and last papers of each month (2).

32. "Before and after" exhibit, placing each child's first paper alongside of his latest (2).

33. Extra credits for penmanship given on spelling, composition, and other written work (1).

34. Encourage self-criticism with scale (3).

35. The pupils keep their own scores and mark improvement (1).

36. "Skating game" for light touch. The paper is an ice pond, the pen is the skater (1).

37. A ball of paper in the hand loosens the tight grip (1).
38. Place a weight on the paper and allow the left hand to hang at your side to relieve rigidity (1).
39. Correct one error at a time (1).
40. Try inter-class contests (2).
41. Have a procession to the office to show good work. Reward the one receiving the largest number of approval stamps. Banner to a class each Monday morning for having the largest number of approval signatures. Term prize for same to a pupil (2).
42. Pen Clubs to work for Palmer Buttons (3).
43. Articles on handwriting in magazines, etc., to keep up the interest of teachers (1).
44. At least one lesson a month is observed and criticized by the Assistant to the Principal in each room (1).
45. The teacher of penmanship is also teacher of composition (1).
46. One-minute test every two weeks, sent to the Assistant to Principal for appraisal (1).
47. Preliminary writing drill in all written work (1).
48. Weekly conference directed by expert scorers (2).
49. Correspondence course taken by several teachers (1).
50. Speed test in spelling (2).
51. Display the new work for the week on a chart (1).
52. All classes on a floor to be taught at the same period so that the principal may pass easily from room to room.
53. An "A" penmanship section (1).
54. Insignia on penholder to indicate correct movement (1).
55. Insist on clean ink (1).
56. Insist on good pens (1).
57. Insist on good quality of paper (1).
58. Have term tests (1).
59. Frequent inspection and appraisal of all penmanship products (10).

7. *The second survey.* This, like the first, was conducted by Mr. Eugene A. Nifenecker, Director of our Reference Bureau. The eight schools that had reached a standard score in all grades in the first survey were excused from the second. As the whole procedure was on a voluntary and coöperative basis, four schools that had two or more grades below standard were, at their request, also excused from the second test. There were therefore only thirteen schools that submitted to the second measurement. Table II shows the number of classes and children concerned, by grades.

TABLE II
Number of Pupils and Classes by Grades Involved in Penmanship Survey

Grades	4B	5A	5B	6A	6B	7A	7B	8A	8B	Total
No. of Classes	29	29	30	32	29	26	26	21	18	240
No. of Pupils	1,037	1,013	1,082	1,056	1,012	896	877	697	680	8,350

In Table III are presented the comparative results of grade and school in the two surveys, showing grade levels attained in Form. Table IV shows similar facts for speed.

A more valid comparison may be made by taking into consideration the fact that most of the pupils who took the 1922 survey were in 1923 two grades higher than in 1922.

PENMANSHIP SURVEY—DISTRICTS 1-7—JUNE, 1923

Comparison of Grade Norms Attained by Pupils of Each Grade in Each School In Form for Penmanship Surveys of 1922 and 1923

[illegible]

¹ School numbers are fictitious.

TABLE IV

PENMANSHIP SURVEY—DISTRICTS 1-7—JUNE, 1923
Comparison of Grade Levels in Rate of Writing Attained by Schools for Penmanship Surveys of 1922 and 1923

Comparison of Grade Levels in 1922 and 1923																		
School ¹	4B		5A		5B		6A		6B		7A		7B		8A		8B	
	1922	1923	1922	1923	1922	1923	1922	1923	1922	1923	1922	1923	1922	1923	1922	1923	1922	1923
1	6A Below 4B	5B Below 4B	6A Below 4B	6A Below 4B	6B 5B Below 4B	6B Below 4B	6B Below 4B	6B Below 4B	6A Below 4B	6B Below 4B	8A Above 8B	6A Above 8B	8A 6B	8A 7A	8A 7B Above 8B	7B	8A	7A
2			4B		5B	5B	7A		7A	7A	6A	7A	7A	7A	Above 8B	7A	8A	6B
3	6A	5A	5A	6A	6B	6A	6B	6B	7B	8A	8A	6B	8A	7A	8B	Above 8B	7A	Above 8B
4	5A Below 4B	5A	-	-	6B Below 4B	6B	6B	5A	6B	6A	6B	5A	5B	6A	7A	7A	7A	Above 8B
5	4B	4B	4B	5B Below 4B	4B	5A	7A	7A	6B	7B	5B	7B	7A	5A	6B	7A	7B	4B
6	5A	4B	5B	5A	6A	5A	7A	5A	6B Above 8B	6B Below 4B	-	-	-	-	-	-	-	-
7	5A Below 4B	4B	6A	5A	6B	6B	5B	5B	7A	7A	-	-	-	-	-	-	-	-
8	4B	4B	6B Below 4B	5B	4B	5B	7A	7A	6A	6A	8B	6B	6B	6B	6A	8A	7A	-
9	-	-	6B Below 4B	5B Below 4B	5A Below 4B	5A	5A	5A	6A	5B	5B	6B	6B	6B	6A	8A	7A	7B
10	Below 4B	Below 4B	7A	7A	7A	6B	6B	Below 4B	6B	5A Above 8B	7A	4B	7B	5B	6B	5B	7A	5B
11	Below 4B	5B	5A	7A	7B	7A	7A	7B	7B	-	-	-	-	-	-	-	-	-
12	6A	4B	Below 4B	4B	Below 4B	4B	5B	4B	6B	5A	6B	Below 4B	7A	6B	5B	5A	5A	5B
13	5A	5B	5A	8B	7B	6A	6A	6A	-	-	-	-	-	-	-	-	-	-

¹ School numbers are fictitious.

By comparing the pupils in one grade in 1922 with the group two grades higher in 1923, we are comparing the achievements of practically the same pupils. It is to be kept in mind, however, that while the groups are approximately the same, they are not wholly so. Numerous changes in pupil population tend to disturb the composition of the groups. Again, it is to be noted that no comparison is possible in the case of the present 4B and 5A pupils, inasmuch as they were a year ago in 3B and 4A classes, which were not included in the 1922 survey.

Table V indicates for each school and pupil group the amount of gain or loss shown by the 1923 achievements as compared with those of 1922. The table also gives the total net change of each school and the average per grade group involved. For instance, in P. S. 1, the first school mentioned, the group which was in 4B in 1922 and in 5B in 1923 shows a median improvement of 5.7 points; the 5A-6A group shows practically no gain; the 5B-6B group gained 6.8 points; the 6A-7A advanced 14 points; and so on. The total gain for the school for the groups compared was 58.3 points, or an average of 8.3 points—almost a full scale step.

At the bottom of the table are shown the number of schools that have made gains, or losses, or no change. The net gain for each grade group is also shown, as well as the average per school. For in-

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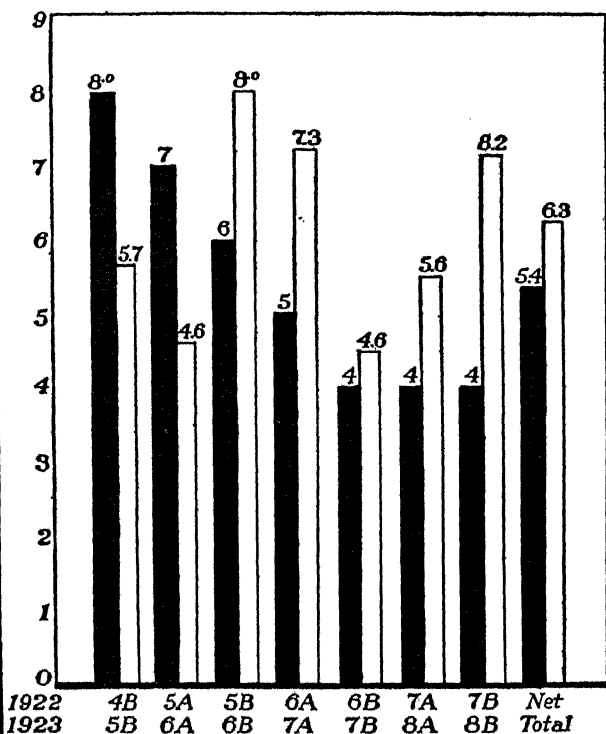
TABLE V

PENMANSHIP SURVEY—DISTRICTS 1-7—JUNE, 1923
Gain or Loss in Attainments between 1922 and 1923 for
Corresponding Pupil Groups

1922	4B	5A	5B	6A	6B	7A	7B	Net Total	Average Per School
1923	5B	6A	6B	7A	7B	8A	8B		
School									
1	+ 5.7	+ 0.8	+ 6.8	+14.1	+10.8	+12.6	+ 7.5	+58.3	+ 8.3
2	+15.0	+ 7.3	+16.1	- 1.1	- 1.7	+ 6.1	+ 4.5	+46.2	+ 6.6
3	- 5.7	+ 1.6	0	+ 2.0	- 4.7	+ 0.6	+ 3.7	+ 2.5	+ 0.4
4	+12.1	+ 8.6	+ 6.8	- 3.3	- 9.2	- 0.6	- 4.6	+ 9.8	+ 1.4
5	+12.7	+ 2.1	+ 5.8	+11.0	+ 7.8	+ 8.0	+16.3	+63.7	+ 9.1
6	+11.6	+ 4.8	+ 5.4	—	—	—	—	+21.8	+ 7.3
7	+ 1.5	-11.2	- 1.7	—	—	—	—	-11.4	- 3.8
8	+ 1.7	0	+ 2.0	- 3.6	- 0.7	—	—	- 0.6	- 0.12
9	—	+17.3	+24.8	+20.5	+11.8	+ 5.7	+17.8	+97.9	+16.3
10	+ 2.8	+17.8	+19.4	+ 8.5	+ 1.3	+ 8.4	+ 9.3	+67.5	+ 9.6
11	+ 2.0	- 9.2	+ 5.4	—	—	—	—	- 1.8	- 0.6
12	+ 3.5	- 9.5	+ 3.2	+ 9.7	+ 9.7	+ 3.2	+ 8.7	+28.5	+ 4.1
13	- 0.2	- 4.3	—	—	—	—	—	- 4.5	- 2.3
No. showing gain	10	8	10	6	4	7	7	52	
Loss	2	4	1	3	5	1	1	17	
No change	—	1	1	—	—	—	—	2	
Total	12	13	12	9	9	8	8	71	
Total net gain or loss	+68.6	+60.3	+95.7	+65.8	+41.4	+44.6	+65.8	+44.2	
Av. Gain or Loss	+ 5.7	+ 4.6	+ 8.0	+ 7.3	+ 4.6	+ 5.6	+ 8.2	+ 6.3	
Standard Gain	8	7	6	5	4	4	4	5.4	

stance, in the 4B-5B group, ten out of twelve schools made a gain and two sustained a loss. The total gain was 68.6 points or an average per school of 5.7 points. Out of all the grade groups involved in the comparisons (71 in number) 52, or 73%, show a gain, while 17, or 24%, show a loss.

The standard increase is shown on the bottom



*Average Gain compared
with Standard Gain*

FIGURE 3

 Standard
 Average

Continued Margaret L. Sullivan

line. For instance, the difference between the 4B grade median and the 5B grade median is 8 points. In four of the twelve schools—Public Schools 2, 4, 5, 6—the growth in the year was greater than the normal intergrade interval of 8 points. In the 5A–6A group the intergrade interval is 7 points, which was exceeded by four schools. In the 7B–8B group the increment is 4 points, which was exceeded by six out of the eight schools. Greater improvement is shown by the higher grades than the lower. The improvement as a whole was considerable and in most of the groups was quite satisfactory.

These gains are graphically shown in Figure 3.

8. Summary of inferences based on the preceding study of the supervision of handwriting.

(1) Supervision of instruction is concededly necessary in elementary grades and to some extent in the secondary school. It is also essential in other arts, such as those relating to the theater and the opera. In industry the foreman and superintendent are accepted as indispensable factors of successful and economical operation and production.

(2) The production of good writing is no exception. The expert supervisor is necessary to coördinate the efforts of individual teachers and children; to economize effort by eliminating wrong movements and forms; and to make the results of

practice cumulative by grading exercises within grades, and articulating grade with grade.

(3) This study shows that in fifty American cities of fifty thousand population or over, educational authorities have found it desirable to employ one or more technical supervisors of penmanship.

(4) My own experiment has convinced me that writing in New York schools will never be wholly satisfactory until we employ at least one special teacher of handwriting in each supervisory unit in charge of a district superintendent. If I had such a teacher at my command, I would undertake to bring up to standard every school in my district within a few years.

(5) Inspirational supervision alone is incapable of overcoming all the resistance in penmanship teaching, any more than hopes, and good wishes, and sound advice can put the first tomatoes on the market. Expert knowledge and skill are needed in certain situations.

(6) In the absence of a technical supervisor our only resource is the principal. But some principals cannot and others will not do what is required for success in handwriting. In such cases the special teacher must go to the individual classroom and show the teacher how to teach. Nobody questions this statement with reference to drawing or music

or physical training. Penmanship requires as much supervisory skill as any of the other subjects named.

(7) The St. Louis Survey studied the effect of the principal's attitude toward penmanship and concluded that it was negligible. But that city has a director of handwriting with a staff of assistants. In a city where there are no technical supervisors everything depends upon the principal's attitude and skill.

(8) A graded course of study in penmanship, or its equivalent, is essential to success. Some cities send out periodically, in lieu of a syllabus, detailed instructions for the conduct of lessons in handwriting.

(9) Late and authoritative researches indicate that abstract drill exercises preliminary to writing are wrong in principle and wasteful in practice. "It is as though a person in training to be a carpenter should spend his time in calisthenics . . . A greater part of the practice in handwriting should be spent in actual writing."

(10) Every teacher of writing should be required to qualify as an expert in the kind of writing she is expected to teach. In some states such a qualification is a condition of employment.

(11) In a number of states handwriting is considered of sufficient importance to require statewide regulation and suggestion. Penmanship man-

uals have been issued by New Jersey, Massachusetts, Ohio, and doubtless by other states.

(12) The measurement of handwriting has come to be widely recognized as essential to success. In my own district, however, the school that has the best writing never used a scale. When this school was measured by Mr. Nifenecker, nearly every grade had attained an 8B standard.

(13) Many people assert that writing should end as a formal drill with the sixth year. If all children were efficiently taught, this might be safe. But under present conditions in New York, I do not advise it. Many of our sixth-grade children write an illegible scrawl. To turn them out with this inadequate training would be unfair to them and to the public condemned to read their future writing.

(14) By combining all grades and schools, the median achievement of my district in handwriting was, in 1922, below standard in *form* in every grade but two, and was above standard in *rate* in every grade but three.

(15) In the second survey, in 1923, *form* had improved, but *rate* had declined. The medians of the two surveys, however, are not strictly comparable, as the schools which had attained standard form in 1922 were not included in the 1923 test. The explanation of the changed relations of form and

speed is probably that the teachers, knowing that another survey was coming, unconsciously stressed form at the expense of speed.

(16) In the second survey sixty-three per cent of the classes made a better score in form than they had in the first survey; seven per cent showed no change; thirty per cent were lower.

(17) A more valid method of measuring progress is to compare grade groups one year apart. For instance, if we compare the attainment of a 4B grade in a given school in 1923 with the same grade in 1922, we are not dealing with the same children, because the pupils who were in 4B in 1922 were in 5B a year later. A table was therefore constructed which compares grade groups one year apart. In this way we are dealing approximately with the same children in the two surveys. In six grade groups thus compared the average gain in twelve schools was greater than the standard intergrade gain.

(18) The Detroit experiment in supervision confirms my own conclusion that "supervision pays," and that "that supervision is most effective which gives special attention to those who need it most." As soon as a class or school reaches standard achievement it should be relieved of external supervision (except an occasional survey to show whether it has fallen from grace!). The same principle

should be applied to individual pupils within a class.

(19) I have proved to my own satisfaction—and cannot make it too emphatic—that teachers untrained in the technique of measurement, are incapable of doing research work that has scientific validity. The sixty-nine scorers of our second survey are teachers of more than average intelligence—for some of them occupy supervisory positions—yet it required twenty hours of intensive training in the simple process of using a penmanship scale to make them sufficiently accurate for our purpose.

(20) When our Department of Education supplied the teachers with a handwriting scale, it took an important first step toward improvement in penmanship; but unless and until it provides training for teachers in the use of the scale, no useful purpose will be served by that instrument.

CHAPTER IX

TOPICS FOR DISCUSSION

1. Give, with reasons, your opinion on each of the following points concerning the teaching of penmanship to beginners:

(a) Should the writing be large or small? Define large and small.

(b) Should the beginning be made with sentences, words, letters of the alphabet, or the elements of letters?

(c) How is the principle of imitation to be utilized in teaching penmanship?

(d) Should a beginning be made with the pen, lead pencil, slate pencil, the blackboard crayon, or the sand table?

(e) Should children in the beginning be drilled in the arm movement and compelled to use the same in writing, or should they be allowed to use the finger movement until the forms of letters are thoroughly familiar?

See Louise Ellison's "The Acquisition of Technical Skill," in *Pedagogical Seminary*, Vol. 16, p. 49 (March, 1909).

¹ A few of these topics are taken from Freeman's *The Psychology of the Common Branches*, Chap. II. (Houghton Mifflin), and some from Monroe, De Voss and Kelly's *Educational Tests and Measurements*, (Houghton Mifflin).

2. What is meant by "organizing a movement" in a subject like penmanship?

See Judd's *Genetic Psychology for Teachers*, pp. 223-225.

Penmanship in a certain school was assigned 15 minutes daily throughout the grades. The exercises were performed in a half-hearted, ineffective manner. . . . The pupils were then told that as soon as any one could write a plain, legible hand with fair rapidity, he would be excused from further penmanship exercises. . . . A similar plan was adopted in spelling. . . . Whenever the individual instead of the class was made the basis for promotion, the results were excellent.

What is the principle here involved, and how far is it applicable?

3. "Children used to write with their sides toward the desk, the right arm wholly and the left partly supported by it."

Criticize this position, and describe the correct position, giving reasons.

4. Give three illustrations of motor habits which are formed in school.

5. Compare the complexity of the writing movement with the walking movement. Why does the child take longer to learn to write than to walk?

6. What is the relation of the slant of writing to legibility? To speed? What is the natural slant?

7. What hygienic reasons were given in support of vertical writing? How have these demands been met in a different way?

8. Does "selection" of appropriate movements mean conscious, deliberate selection? If not, what is the method?

9. Discuss the saying, "Practice makes perfect."

10. Discuss the statement, "If the child is trained in the correct movement, the form of the letters will take care of itself."

11. Explain several methods of stimulating the child to study the form of writing.

12. Compare the old methods of grading (or measuring) the child's work with the standardized scale method.

13. Why should the correct habit be practiced in all writing? Put this rule in the form of a general principle and illustrate from two other subjects of study.

14. Compare the movements made by a child of three years and a child of ten and inquire whether the fundamental-accessory theory explains the difference.

15. Considering the motor development of the child and the need of making writing automatic, when do you think the formal writing drill should be emphasized most?

16. Discuss the aim of bringing all the children of a grade up to grade standard and then excusing from formal drills all who are above this standard.

17. A teacher may judge the handwriting of her

class by watching the pupils while they write or by examining the specimens which they have written.

(a) Which is the better method if the object is to compare class with class?

(b) Which is better for discovering the handwriting defects of individuals?

(c) What factors would you keep in mind in watching while they write?

(d) What factors in the other method?

18. In what situations would you use the Ayres Scale? The Thorndike? The Johnson-Stone? The Freeman? The New York? Gray's Score Card?

19. What factor of handwriting is of most importance according to Gray's Score Card? What factor is of least importance? Why are these factors so rated? Do you approve these ratings? Why?

20. For what purpose would you use dictation exercises?

21. Discuss: (a) Pronation; (b) Hand support; (c) Angle of arm with base line; (d) Relation of finger and thumb; (e) Grasp of penholder.

22. In what grades (if any) and for what purpose and for what length of time would you recommend whole-arm movement?

23. Define rhythm in handwriting and show its purpose; also its relation to age, quality, and speed.

24. State three laws of habit formation and illus-

trate their application to the teaching of penmanship.

25. Briefly discuss graphology and show its relation to the experimental study of handwriting.

26. Write ten propositions or general principles derived from the physiology and psychology of handwriting.

27. Explain a method of teaching an illiterate adult how to write his name in three lessons.

28. Discuss the advantages of the departmental system of teaching handwriting.

29. Why do we teach handwriting? Name and discuss three or four "objectives" of penmanship.

30. Discuss the supervision of handwriting under the following heads:

(a) The specialist or penmanship supervisor. Explain what he should do, and under whose authority he should work.

(b) The principal.

(c) The superintendent.

31. Describe three writing scales and tell under what circumstances each is most useful.

32. Discuss in some detail the *motivation* of penmanship, naming the best incentive and six useful devices.

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